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ABSTRACT

The modules which make up the bulk of this report are the result of a two-week workshop at which thirteen building industries occupations teachers worked toward the development of a student outcome oriented curriculum. These modules are divided into the following occupational units: (1) carpentry (containing hand tools; portable power tools; footing and foundation forms; framing of decks, walls, roofs, and roof coverings; and interior and exterior finish); (2) electrical (containing circuitry; overhead service entrance; lateral service entrance; main and sub-panel; and signaling and remote control devices); (3) masonry (containing mixing mortar, basic brick work techniques, basic block work, plastering, tile setting, and stone work); and (4) environmental control (containing basic physics of climate control, duct work, and pipe assembly). Each module lists the task, major objective, and enabling objectives; most contain suggested instructional content. At the end of each unit a task check-list is included for the instructor to identify individual tasks completed by the students. Also included are suggestions on the use of the modules and additional comments made by the workshop participants. (CT)

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ED164847

INSTRUCTIONAL SUPPORT SYSTEM - OCCUPATIONAL EDUCATION

BUILDING INDSUTRIES OCCUPATIONS

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INTRODUCTION

In the summer of 1976, thirteen building industries occupations teachers gathered at a two week ISSOE Summer Workshop, and following the definitions contained in the glossary, worked toward the development of a curriculum that was student outcome oriented. During the 1976-77 school year, teachers in the Orange county-Dutchess county region, Albany region, and Buffalo-Erie county region met on a monthly basis and continued to work on the development, expansion, refinement, and implementation of these materials. Modifications in the original document based on the work and experience of these groups of teachers are incorporated in the body of this document. It is believed by these teachers that further work is needed in these areas of suggested instructional content and the criterion referenced assessments as well as in the development of additional modules that may have been omitted. In particular, more work is needed in the environmental control unit and in the development of a unit in plumbing. The major premises for this curriculum development effort during the 1976-77 school year are shown below:

1. Lesson plans would be developed from the modules.

2. Safety and terminology belong in each module.

3. Instructional and work settings will vary from place to place. Thus instructional strategies and techniques are to be developed and implemented by the teachers according to the conditions in their schools.

4. Sequencing of modules may vary from region to region and site to site.

5. The modules represent common knowledges and skills taught across the State of New York. However, no instructor is limited to these modules, nor must all of them be taught.

6. Some of the modules may be attempted in the early stages of related courses of study, such as carpentry or masonry.

It is expected that similar working arrangements and agreements will form the bases for the 1977-78 effort as ISSOE undergoes an expansion into more Occupational Education Planning Regions of the state.

A series of comments are appended to the curriculum modules to stimulate discussion during the 1977-78 school year and to make it clear to the people in the regions who are continuing with or joining the ISSOE effort that these materials are meant to be subjected to a continuing process of evaluation and revision.

ACKNOWLEDGEMENTS

We would like to take this opportunity to thank the many people who were responsible for the success of the ISSOE 1976-77 project. In particular, we would like to thank the teachers:

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The dedication and professionalism exhibited by the regional coordinators and the teachers they worked with were in large measure responsible for the success of the 1976-77 ISSOE effort.

GLOSSARY

COURSE:

A State-approved course of study. The course consists of modules on instruction essential to the acquisition of competencies expected by the world of work.

UNIT:

A portion of the course which consists of a logical clustering of modules of instruction.

MODULE:

A portion of the course which addresses related tasks drawn from occupational analysis expressed in performance terms. Each module contains one or more tasks and major objectives, suggested instructional content and criterion referenced assessment.

TASK:

An activity which has a definite beginning and ending, and is performed within a limited period of time by an individual. One or more tasks are included in each module.

MAJOR OBJECTIVE:

A statement of what the student should be able to do, the conditions under which the task will be performed, and the standards for evaluating the performance. The achievement of a major objective will be reported as a component of the student's employability profile.

ENABLING OBJECTIVE:

A subordinate objective which describes in performance terms a cognitive, affective, and/or psychomotor skill which the student will need to accomplish the major objective. Achievement of an enabling objective is not reported; performance of and recording of this achievement is left to the descretion of the instructor.

SUGGESTED INSTRUCTIONAL CONTENT

A brief listing of suggested demonstrations and points of information which the instructor may wish to employ to assist the student in meeting the major objective.

CRITERION REFERENCED ASSESSMENT:

Criterion referenced assessment is derived from the performance objectives and directly measures the individual student's ability to successfully complete the tasks identified in the module. The test items are performance-based and replicate as closely as possible the tasks as they would be evaluated in the world of work.

COURSE OUTLINE

BUILDING INDUSTRIES OCCUPATIONS

UNIT I CARPENTRY

MODULES:
1. Orientation
2. Hand Tools
3. Portable Power Tools
4. Footing and Foundation Forms
5. Deck Framing
6. Wall Framing
7. Roof Framing
8. Roof Covering
9. Exterior Finish
10. Interior Finish

UNIT II ELECTRICAL

MODULES:
1. Orientation
2. Circuitry
3. Overhead Service Entrance
4. Lateral Service Entrance
5. Main and sub-panel
6. Signaling and Remote Control Devices

UNIT III MASONRY

MODULES:
1. Orientation
2. Mixing Mortar
3. Basic Brickwork Techniques
4. Brickwork Construction*
5. Basic Block Work
6. Block Work Construction*
7. Basic Concrete*
8. Concrete Technology*
9. Plastering
10. Tile Setting
11. Stone Work

UNIT IV ENVIRONMENTAL CONTROL

MODULES:
1. Basic physics of climate control
2. Duct Work
3. Pipe Assembly

*outlines of these Modules are included or have been suggested as being important

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COURSE: BUILDING INDUSTRIES OCCUPATION

MODULE: ORIENTATION

UNIT: CARPENTRY

TASK: LIST RULES AND PROCEDURES

CODE:

MAJOR OBJECTIVE

The student will list all general rules and procedures used in the carpentry shop.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will list: - safety rules - fire exits and drill procedure - time schedule of program - shop management - handbook regulations	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: ORIENTATION
CODE:

STUDENT NAME:
SCHOOL YEAR:

☐ MET MAJOR OBJECTIVE
DATE COMP.
☐ NEEDS FURTHER INSTRUCTION

MAJOR OBJECTIVE: The student will list all general rules and procedures used in the carpentry shop

TASK:	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	
1. List all general rules used in the shop		-----	-----	------		
2.						
3.						
4.						
5.						
6.						
7.						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: HAND TOOLS

TASK: IDENTIFY AND DEMONSTRATE USE OF EACH LAYOUT, MEASURING AND CHECKING DEVICE

MAJOR OBJECTIVE

Given the necessary layout, measuring, and checking devices for carpentry, the student will display proper and safe use of each tool.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C.
The student will: - identify layout, measuring & checking tools necessary to perform the basic tasks in the carpentry trades - measure and plot given distance to the nearest 1/16 of an inch - locate working lines at right angles to a working edge - transfer various angles from one surface to another - compute board footage with a rafter square using the essex board measure scale - check vertical and horizontal surfaces for plumb on level - layout lines parallel to a given edge - layout common roof rafter - determine length of wall studs and various structural members of the house - level and plumb surfaces - drop (structural) points vertically - display correct use of story-pole - level with a builder's level - sight a level line	Demonstrate safe and correct use of each layout and measuring tool Demonstrate proper care and maintenance of the various layout tools Identify layout tools by their proper name Review various tool catalogs and manuals Demonstrate proper use of a builder's level	Page 8

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVES: Given the necessary layout, measuring and checking devices for carpentry, the student will display proper and safe use of each tool

TASK: Identify & demonstrate use of each layout, measuring and checking device

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Rafter square (layout common rafter, essex board measure)						
2. Try square						
3. Steel tape rule						
4. Level						
5. Combination square						
6. Folding rule						
7. Sliding -T- bevel						
8. Chalk line						
9. Plumb bob						
10. Line level						
11. Marking gauge						
12. Story-pole						
13. Builder's level						
14. Transit						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: HAND TOOLS

UNIT: CARPENTRY

TASK: IDENTIFY, SELECT AND USE PLANING, SMOOTHING AND SHAPING TOOLS

CODE:

MAJOR OBJECTIVE

Given planing, smoothing and shaping tools, the student will use each tool on a specific job relating to the carpentry trade.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C.
The student will: - identify each type of planing, smoothing, and shaping tool necessary to perform related individual tasks in the carpentry trades - properly adjust each type of tool - demonstrate safe and proper use of those tools needed for squaring wood stock (end, edge, and face grain planing) - demonstrate safe and proper use of those tools needed for creating a dado and rabbet joint - demonstrate proper maintenance of each type of tool	Review proper names of each type of planing, smoothing and shaping tool available for the carpentry trade Demonstrate safe and proper use of each type of tool for this module Review technical information pertaining to proper adjustments, maintenance and care of each type of tool	Page 12 & Page 13

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVES: Given planing, smoothing and shaping tools, the student will use each tool on a specific job relating to the carpentry trade.

TASK: Identify, select and use planing, smoothing and shaping tools

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Block plane						
2. Jack plane						
3. Cabinet makers plane						
4. Wood chisels						
5. Scraper						
6. Cornering tool						
7. Putty knife						
8. Surform tool						
9. Wood file						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: HAND TOOLS

TASK: USE HANDSAWS

MAJOR OBJECTIVE

Given handsaws, the student will safely use each type necessary to perform the individual task requirements in residential construction.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C.
The student will: - identify and select the various handsaws needed for each type of task - properly select and safely use each type - rip and crosscut a given board, to a given length or width, accurately - cut a miter - cut the proper material with each type of saw - change blades on those saws that are equipped with removable blades - cut irregular shapes from a given board	Demonstrate the safe and proper use of a Rip and Crosscut saw Demonstrate the safe and proper use of all other types of saws applicable in the carpentry trade Review technical information on setting and sharpening the various saw blades Review proper maintenance and care of each type of saw	Page 10

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVES: Given handsaws, the student will safely use each type necessary to perform the individual task requirements in residential construction.

TASK: Use handsaws

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Cross cut saw - 28"						
2. Rip saw - 28"						
3. Back saw						
4. Keynole saw						
5. Hack saw						
6. Miter box (saw)						
7. Coping saw						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: HAND TOOLS

TASK: SELECT AND USE FASTENING & DISASSEMBLING TOOLS

MAJOR OBJECTIVE

Given an assortment of fastening and disassembling tools, the student will select and safely use each tool

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C.
The student will: - Identify: Ripping bar, Rip chisel, Plastic tip hammer, Curved Claw Hammer, Rip Claw Hammer, Half Hatchet, Adjustable Wrench, Open End Wrenches, Screw Drivers, Nail Set, Pliers, Nail Puller, Staple Gun, Tackers, Sledge Hammer - Select and properly use tools for nailing and removing nails - Select and properly use tools for setting screws - Select and properly use tools for gripping - Select and properly use tools for splitting various lumber products - Properly maintain each tool used for fastening and disassembling - Select brand names of tools - Select and properly use tools needed for setting nails	Review the proper names of each tool used for fastening and disassembling in the carpentry trade Demonstrate the safe and proper use of each type of tool Demonstrate proper care and maintenance of each tool Handsheet - parts of each tool Review catalogs and manuals on types of fastening and disassembling tools available	Page 16

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given an assortment of fastening and disassembling tools, the student will select and safely use each tool.

TASK: Select and use fastening and disassembling tools

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Ripping bar						
2. Ripping chisel						
3. Plastic tip hammer						
4. Rip & curved claw hammer						
5. Half hatchet						
6. Adjustable wrenches						
7. Open end and box wrenches						
8. Screwdrivers						
9. Nail set						
10. Pliers						
11. Nail puller						
12. Staple gun						
13. Tackers						
14. Sledge hammers						
15. Ratchet screwdriver						

10

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: HAND TOOLS

TASK: IDENTIFY AND SAFELY USE DRILLING AND BORING TOOLS

MAJOR OBJECTIVE

Given hand drilling and boring tools, the student will use and take care of each tool needed for the construction of a residential structure.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify the basic hand drilling and boring tools used in the carpentry trade Auger bits — Expansive Bit Bit Brace — Lockset Bit Push Drill — Drill Points Hand Drill — Countersink - bore holes from 1/4" to 1" - drill various size holes for setting screws (pilot shank drilling) - select the drilling & boring tools best suited for a particular job - properly install drills & auger bits into the proper handle - display proper care and maintenance of each drilling & boring tool	Review proper names of each type of drilling & boring tool Demonstrate safe and proper use of each drilling and boring tool Demonstrate proper care and maintenance of each drilling and boring tool Hand out sheets displaying parts of each tool Review various tool catalogs and manuals

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COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE:
Given the necessary hand drilling & boring tools, the student will display correct use & care of each tool during the construction of a residential structure.

TASK: Demonstrate safe and proper use of each tool and their attachments.

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Push drill						
2. Bit brace						
3. Hand drill						
Selection and use						
Auger bits						
Twist drills						
Drill points						
Countersink						
Lockset bit						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: PORTABLE POWER TOOLS

TASK: SAFELY USE PORTABLE ELECTRIC DRILL

MAJOR OBJECTIVE

Given tools and supplies, the student will drill various size holes using the portable electric drill throughout the construction of a residential structure.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	MC. Page
The student will: - identify and describe the various parts of the drill - describe the safety requirements necessary to operate the portable electric drill accurately and safely - select and identify the various drill and attachments available for use with an electric drill - drill holes perpendicular to wood surface - drill holes at various angles to wood surfaces - install various drill and attachments properly - demonstrate safe & proper use of all attachments - demonstrate proper care and maintenance of the portable electric drill	Review parts and describe their function Review operational safety Review and demonstrate safe and proper use of all attachments available for the portable electric drill Demonstrate proper drilling methods Review care and maintenance of portable electric drill	31-32

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE:
Given the necessary tools and supplies, the student will drill various size holes using the portable electric drill throughout the construction of a residential structure

TASK: Demonstrate safe & proper use of portable electric drill (drilling)

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify parts						
2. Operational safety						
3. Drilling						
4. Attachments (use of)						
5. Changing attachments						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: PORTABLE POWER TOOLS

TASK: PERFORM CUTS OF PORTABLE POWER SKILL SAW

MAJOR OBJECTIVE

Given portable power skill saw, the student will safely perform all the required cuts necessary to construct a residential wood structure.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT M.C. Page 27
The student will: - identify and describe the function of each part found on the saw - describe the safety requirements necessary to operate the tool safely - describe & demonstrate the proper use of each type of blade available for the skill saw - accurately cross cut a given board to a desired length - accurately rip a given board to a desired width - accurately demonstrate the proper use of the rip fence attachment - accurately adjust the depth of cut gauge for cutting various sizes of wood stock - accurately adjust tilt adjustment for cutting various bevel cuts - select and change blades properly - demonstrate safety & proper use of this portable power tool at all times - demonstrate proper care and maintenance of the skill saw	Review parts of skill saw - their function Describe the importance of the various safety rules necessary to operate the skill saw safely and accurately Describe the various blades available and demonstrate the type of cut each blade performs Demonstrate ripping and crosscutting Demonstrate the safe and proper use of all attachments available for the skill saw Demonstrate the proper methods of adjusting the saw before using Demonstrate blade changing

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Give a portable skill saw, the student will safely perform all the required cuts necessary to construct a residential wood structure.

TASK: Cut structural framing & various building materials with the skillsaw - demonstrate safe & proper use

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify parts - describe						
2. Operational safety						
3. Blade selection						
4. Use of each type of blade						
5. Cross cutting						
6. Ripping						
7. Use of rip fence						
8. Adjusts saw accurately						
9. Bevel cutting						
10. Changing blades						
11. Care and maintenance						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: PORTABLE POWER TOOLS

UNIT: CARPENTRY

TASK: SAFELY USE SABRE SAW

CODE:

MAJOR OBJECTIVE

Given a sabre saw, the student will safely use it to cut irregular shapes and scroll work.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify and describe the various parts of the saw - describe the safety requirements necessary to operate the machine accurately and safely - identify and select the proper blade for cutting - replace damaged or broken blade, accurately crosscut a given board to length - accurately rip a given board to a desired width - bevel cut - plug cut - demonstrate safe & proper use of all attachments - demonstrate proper care & maintenance of the sabre saw	Review parts and their function Review safety rules necessary to operate machine safely Describe the various blades available and how to change a damaged blade Demonstrate ripping and crosscutting Demonstrate bevel and plug cutting Demonstrate the proper methods of adjusting the various attachments

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary portable power tools for cutting irregular shapes and scroll work the student will safely and accurately demonstrate the proper use of the sabre saw. TASK: Demonstrate various cuts with the sabre saw	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify parts						
2. Operational safety						
3. Ripping						
4. Crosscutting						
5. Bevel cutting						
6. Plug cutting						
7. Select & replace blades						
8. Attachment use						
9. Care and maintenance						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: PORTABLE POWER TOOLS

UNIT: CARPENTRY

TASK: USE THE ROUTER SAFELY

CODE:

MAJOR OBJECTIVE

Given a portable router and attachments the student will perform all necessary operations needed for the construction of a residential structure

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify and describe the various parts - describe the safety requirements necessary to operate the router accurately & safely - select & identify the various cutters available (bit selection) - install a bit properly - route curved edges - route straight edges - demonstrate proper use of the guide attachment - cut a groove - cut a dado - cut for a dovetail joint - cut a hinge gain - properly adjust router - cut chamfer edge on formica counter top - demonstrate safe and proper use of all attachments - demonstrate proper care and maintenance of the portable electric router	Review purpose and function of all attachments and parts of the router Demonstrate the variety of cuts made with the portable electric router Review safety and maintenance requirements

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: HAND TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given a portable router and attachments, the student will perform all necessary operations needed for the construction of a residential structure.

TASK: Demonstrate various cuts with portable router

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify and describe parts						
2. Operational safety						
3. Selector & identification of bits						
4. Bit installation						
5. Route curved edges						
6. Route straight edges						
7. Use of guides and templets						
8. Cut a groove						
9. Cut a dado						
10. Hinge gain						
11. Adjusting router						
12. Shape formica edge						
13. Dovetail						
14. Care & maintenance						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: POWER TOOLS

TASK: USE THE RADIAL ARM SAW SAFELY

MAJOR OBJECTIVE

Given a radial arm saw and the necessary attachments, the student will perform the various cutting operations applicable to the construction of a residential structure.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify and describe the function of the various parts of the radial arm saw - demonstrate and describe the safety requirements necessary to operate the radial arm saw safely and accurately - identify and select the best blade for a given job - change blades - cross cut a board to a given length - rip a board to a given width - adjust for operation - cut a miter - cut a compound miter - perform proper care and maintenance	Review operational safety and function of all parts Demonstrate - ripping, crosscutting, mitering changing blades and adjustments for operation

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: PORTABLE POWER TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVES: Given a radial arm saw and the necessary attachments the student will perform the various cutting operations applicable to the construction of a residential structure.

TASK: Demonstrate safe & proper use of a radial arm saw

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify parts and function of each						
2. Operational safety						
3. Blade identification & selection						
4. Change blade						
5. Crosscutting						
6. Ripping						
7. Adjusting						
8. Mitering						
9. Care and maintenance						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: PORTABLE POWER TOOLS

UNIT: CARPENTRY

TASK: USE TABLE SAW SAFELY

CODE:

MAJOR OBJECTIVE

Given a table saw and the necessary attachments the student will demonstrate various types of cuts.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT M.C. Page 38
The student will: - identify and describe the various parts of the table saw - demonstrate and describe safety requirements necessary to operate the table saw accurately and safely - identify and select the proper blade - change blades - properly adjust machine - cross-cut using mitering fence - rip a given board using the rip fence - miter a given board - cut a compound miter - cut a dado - perform proper care and maintenance	Review operational safety and function of all parts Demonstrate - ripping, crosscutting, mitering, cutting a dado, adjusting, changing blades, cutting compound miter, etc. Review types of blades available Review maintenance gear lubrication and blade care and storage

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: PORTABLE POWER TOOLS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVES: Given a table saw and the necessary attachments, the student will demonstrate the various types of cuts made with this machine.

TASK: Demonstrate safe and proper use of table saw

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify & describe parts						
2. Operational safety						
3. Blade selection						
4. Changing blades						
5. Machine adjusting						
6. Crosscutting						
7. Ripping						
8. Mitering						
9. Dado						
10. Care and maintenance						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: FOOTING AND FOUNDATION FORMS

TASK: SITE LAYOUT AND ERECTING BATTER BOARDS

MAJOR OBJECTIVE

The student will select necessary tools, equipment and material, and construct batter boards delineating excavation line, footing line and building line to trade specifications and within instructor's allotted time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - locate corner monuments and establish lot lines - locate front corners of building and drive stakes and nail building line - locate third corner - drive stake and nail building line 3, 4, 5 Rt. △ builder's level - locate fourth corner - drive stake and nail building line - check angles of corners (diagonal measurement method) - offset for batter board location - erect batter boards - locate on batter boards: elevation — footing line excavation line — building line	Discuss: - plot plans - methods of establishing a 90° corner - diagonal method of checking a layout - offset for batter boards - batter board lines

COURSE: BUILDING INDUSTRIES OCCUPATION

UNIT: CARPENTRY

CODE:

MODULE: FOOTING AND FOUNDATION FORMS

TASK: BUILD A STRAIGHT WALL FORM

MAJOR OBJECTIVE

The student will select tools, equipment and material, and build a straight wall form according to trade standards and within instructor's specified time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - read and interpret the plans and specifications - layout and place the shoe - construct the wall - layout for wall ties - install walers and strong backs - align and brace the wall - locate and install anchor bolts - construct a bulkhead - install window and door bucks	Discuss: materials terminology procedures form panels oiling forms

COURSE: BUILDING INDUSTRIES OCCUPATION

UNIT: CARPENTRY

CODE:

MODULE: FOOTING AND FOUNDATION FORMS

TASK: BUILD FOOTING FORMS FOR WALLS, CHIMNEYS AND COLUMNS

MAJOR OBJECTIVE

The student will select tools, equipment and material, and build, set and place a footing form for a wall, a chimney and a column according to trade standards and within instructor's specified time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - read and interpret the plans and specifications. - construct a form for a wall footing - construct a form for a chimney footing. - construct a form for a lally column	Discuss: safety purpose sizes and types terminology plans and specs materials job preparation 3-4-5 method diagonal method

COURSE: BUILDING INDUSTRIES OCCUPATION

UNIT: CARPENTRY

CODE:

MODULE: FOOTING AND FOUNDATION FORMS

TASK: STRIP, CLEAN AND STACK MATERIAL

MAJOR OBJECTIVE

The student will select tools and equipment, and will strip, clean, oil and stack form material according to trade standards and within instructor's specified time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - disassemble existing form - remove nails and concrete from lumber - oil the form sheathing - stack the material	Discuss: safety future use of materials

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: FOOTING AND FOUNDATION FORMS
CODE:

STUDENT NAME:
SCHOOL YEAR:

☐ MET MAJOR OBJECTIVE
DATE COMP.
☐ NEEDS FURTHER INSTRUCTION

MAJOR OBJECTIVE: FOR ALL MAJOR OBJECTIVES IN THIS MODULE

CONDITIONS: LIVE OR FULL SCALE

TASK:

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs Further Instruction
1. Site layout and erecting batter boards						
2. Build and set in place footing forms for walls, chimneys, and columns						
3. Build and set wall form						
4. Strip, clean and stack material						
5.						
6.						
7.						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: DECK FRAMING

TASK: LAY OUT AND INSTALL FLOOR JOIST AND BOX HEADER

MAJOR OBJECTIVE

The student will select and install floor joist and box header to plans and or specifications, with floor joist resting directly on the X side of the line with ± 1/8" to instructor's acceptable time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - layout floor joist and box header using 50' tape to acceptable trade standards. - select the size and length of material for joist and box header according to plans, codes or instruction. - select nails and nail joist and box headers according to acceptable trade standards. - straighten header and girder; nail joist at lap and to girder.	- objective sheet for unit--deck framing. - information sheets--floor joist and box header - assignment sheet--material estimating - job sheets - installation of floor joist - transparency 1. types of framing 2. floor & sill members 3. fasteners - test-written performance - discuss: 1. 16" and 24" o.c. layout 2. crowning joists 3. methods of attaching joists to girders

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: DECK FRAMING

TASK: INSTALL BRIDGING

MAJOR OBJECTIVE

Given tools and materials, the student will install bridging in a given floor system as required by the local and/or state building code standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - know the types and purpose of bridging - be able to properly install wood or metal cross member bridging using current building techniques - be able to install solid bridging using current building techniques	objective sheet -- deck framing information sheets -- bridging #1 lay out and install bridging a. wood x bridging b. steel x bridging c. wood solid test -- written operations

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: DECK FRAMING

UNIT: CARPENTRY

TASK: PLACE AND ATTACH SUB-FLOOR

CODE:

MAJOR OBJECTIVE

Given tools and materials, the student will place and attach the sub-floor to instructor's acceptable time and standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - snap a chalk line across entire deck - place sub-floor material - attach material to floor joist and carry 16 o.c.	A. objective sheet for unit--deck framing B. information sheets --sub-floor (lumber) (plywood) (nails) C. job sheets #3 sub-floor D. transparency #4 sub-flooring #5 #6 E. test -- written operations discuss: 1. types of sub-flooring 2. breaking joints 3. nailing 4. straightening joists

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: DECK FRAMING

TASK: INSTALL SILL SEALER AND SILL PLATE

MAJOR OBJECTIVE

Given tools and material, the student will install sill sealer and sill plate to instructor's acceptable time and standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - define basic building terms - place sill sealer - place sill plate - secure sill plate	- objective sheet -- floor framing - information sheets --sill sealer and sill - job sheet #1 - transparency 1. types of framing 2. floor and sill members 3. fastening sills to foundation 4. fasteners - assignment sheet --estimating sill material - written test

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: DECK FRAMING

UNIT: CARPENTRY

TASK: SET COLUMNS AND FABRICATE GIRDERS

CODE:

MAJOR OBJECTIVE

Given tools and materials, the student will position, plumb and brace the lally columns, and build and straighten a laminated wood girder. Columns will be plumb to within 1/16 in. per. 6 ft. and girder will be straightened to a line to within 1/16 in. at any point, and all joints will be located above the columns.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - locate and position each column to ± 1/16" accuracy - cut, erect, plumb and brace each column to an accuracy of 1/16" per 6' of length - cut and crown material for girder to accuracy of 1/16" per 16'. All joints shall be centered directly above the columns - place, straighten and nail girder members. Finished girder to be straight to within 1/16" to a line at any point	Types of columns 1. wood 2. steel and concrete 3. adjustable Types of wood girders 1. solid 2. laminated 3. advantages and disadvantages of each: How to locate for the columns How to cut, plumb and brace a column Placement of joints in a laminated girder Nailing a laminated girder

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: DECK FRAMING

TASK: FRAMING OPENINGS

MAJOR OBJECTIVE

Given specifications, the student will select tools, equipment and materials and layout opening and cut and erect header and tail joist to ± 1/16" according to trade standards and instructor's acceptable time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - layout finished rough opening size to tolerance of ± 1/16" - select dimension and length for proper installation with maximum waste 23 7/8' - measure, mark, cut, place and nail joist headers and tail joist	- test - operation sheet - 3-M transparencies #2 floor & sill framing - demonstrate procedures and techniques - job sheet #1 - information sheets -- frame openings - test -- written operations - discuss: 1. joist nomenclature 2. framing techniques

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: DECK FRAMING
CODE:

STUDENT NAME:
SCHOOL YEAR:

☐ MET MAJOR OBJECTIVE
DATE COMP.
☐ NEEDS FURTHER INSTRUCTION

CONDITIONS: LIVE, FULL SCALE OR ACTUAL CONSTRUCTION.

TASK:	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further instruction
1. Place sill seal and sill plate						
2. Fabricate and install girder and columns						
3. Lay out and install floor joist and box header						
4. Frame well hole						
5. Install bridging						
6. Place and fasten sub-floor						
7.						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: WALL FRAMING

UNIT: CARPENTRY

TASK: CUT & LAYOUT PLATES

CODE:

MAJOR OBJECTIVE

The student will select materials and tools, and will cut and layout sole and upper plates according to the plans and specifications. All measurements will be to a tolerance of ± 1/16".

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - define the basic terms used in wall framing - select material of a length that will produce the least amount of waste and that will produce a straight plate - measure and cut the plate material to proper length ± 1/16" - measure and mark the 16" O.C. spacing for studs on both plates - measure and layout the locations for door and window openings and intersecting walls on both plates ± 1/16"	Demonstrate: Layout Window Door Inter-wall Doublers Discuss: Material — Methods Terms — Window R.O. Safety — Doors R.O. Symbols

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: WALL FRAMING

UNIT: CARPENTRY

TASK: CUT STUDS

CODE:

MAJOR OBJECTIVE

Given tools, materials, and prints the student will cut the required number of studs for a given wall. The length shall be ± 1/8" of specified finished ceiling height. Task will be completed within a given time period.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: -determine from plans the number of full length studs required for a given wall with 16" O.C. -determine from plans the number of odd length studs required for a given wall with 16" O.C. -select lumber by identifying and avoiding lumber defects -measure and mark master stud using tape and print so that finish length will be within 1/8" of given finish ceiling height -measure and mark odd length studs to prints specs -construct a jig capable of accurately cutting all studs to length -cut studs to length safely using hand portable electric or radial arm saw -stack and stick finished studs in groups of required length	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: WALL FRAMING

TASK: CONSTRUCT CORNER AND PARTITION-STUDS AND HEADERS

MAJOR OBJECTIVE

The student will select proper tools and materials, and construct corner studs, partition-studs and headers according to plan and specifications within instructor's time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - determine and select studs and cut filler blocks - assemble component parts of a specified style corner post or partition stud - determine header length from the R.O. size - select and cut material to length and spacers - assemble header pieces according to instructor	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: WALL FRAMING

TASK: ASSEMBLE A WALL SECTION

MAJOR OBJECTIVE

Given a supply of pre-fabricated parts, student will select the necessary assembly parts and tools and will assemble a wall section according to the plans and specifications, meeting acceptable trade standards and instructor's acceptable time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - select and place the wall parts in a systematic manner - nail the wall parts	Discuss: crowning studs placement of parts methods safety symbols Demo: nailing procedure

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: WALL FRAMING

UNIT: CARPENTRY

TASK: ERECT, PLUMB AND BRACE WALL SECTION

CODE:

MAJOR OBJECTIVE

The student will select materials, and equipment, and snap chalk line to 0 tolerance on deck, tip-up wall section, plumb and brace to ± 1/16" within 8' and straighten and nail wall to ± 1/16" tolerance to line, within instructor's time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - snap chalk lines on deck to show location of inside edge and end of wall - tip up a wall using proper lifting methods of body dynamics - install temporary wall braces and cleats, and nail shoe - finish brace a tipped-up nailed-in-place wall to plumb and straighten	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: WALL FRAMING

UNIT: CARPENTRY

TASK: APPLY SHEATHING

CODE:

MAJOR OBJECTIVE

Given the tools, and materials, the student will identify and apply sheathing to a wall section according to manufacturer's specifications or local building code within instructor's time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - determine the amount of sheathing required to sheath the exterior of a wall - identify five different types of sheathing which are available for residential use - select and install sheathing as per manufacturer's specifications	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: WALL FRAMING
CODE:

STUDENT NAME:
SCHOOL YEAR:

☐ MET MAJOR OBJECTIVE
DATE COMP.
☐ NEEDS FURTHER INSTRUCTION

CONDITIONS: LIVE, FULL SCALE OR ACTUAL CONSTRUCTION

TASK:	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	
1. Lay out plates						
2. Cutting studs to length						
3. Construct corners, partition studs and headers						
4. Assemble wall section						
5 Erect, plumb and brace wall section						
6. Sheath wall						
7.						

UNIT: CARPENTRY

MODULE: WALL FRAMING

Name _____ Date _____

WALL FRAMING TERMS

DIRECTIONS: In the space provided at the left of each definition in the first column, place the letter identifying the term defined from the second column. (10 pt. each)

1._____ The lower framing member which is attached to the top of the bottom cripple studs and forms the base of a rough opening for a window.

2. _____ A wall which supports the floors and/or roof directly above it in addition to its own weight.

3. _____ The lowest horizontal member of a wall or partition which rests on the rough floor to which the studding is nailed.

4. _____ The use of wood blocks as filler pieces between framing members.

5. _____ The opening for doors, windows, etc. formed by the framing members.

6. _____ The top and two sides of a door or window frame which contact the door or sash.

7. _____ Any part of a framing stud that is cut less than full size as over a door or window opening and under a window opening.

8. _____ A wall that subdivides space within a building.

9. _____ The main vertical framing members in walls and partitions.

10. _____ The top most member of a wall section attached to the top of the studs for the purpose of stiffening the wall and for tying together splices, corners, and partitions that are at right angles to a wall.

A. Bearing wall
B. Blocking
C. Bridging
D. Cripple stud
E. Double plate
F. Header
G. Jamb
H. Knee wall
I. Lath
J. Partition
K. Rough opening
L. Rough sill
M. Sole plate
N. Stud
O. Trimmer or jack
P. Waler
Q. Z bar

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: ROOF FRAMING

TASK: IDENTIFY ROOF FRAMING TERMINOLOGY

MAJOR OBJECTIVE

Given a list of roof framing terms, the student will identify the various component parts of a gable roof or various roof systems to trade standards and teacher's specified time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Each student will be able to identify: - roof types - related roof members - roof truss systems - layout terms - roof sheathing	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: ROOF FRAMING

UNIT: CARPENTRY

TASK: LAYOUT PLATE AND RIDGE

CODE:

MAJOR OBJECTIVE

The student will select the tools and materials, and layout the top plate and ridge for a gable roof to trade standards and teacher's specified time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - select material - measure, layout, square material - use tools - follow safety practices	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: ROOF FRAMING

UNIT: CARPENTRY

TASK: ERECT THE ROOF FRAME

CODE:

MAJOR OBJECTIVE

The student will select the necessary tools, equipment, and materials, and set necessary scaffolding from given information, and erect and brace gable roof frame, plumb and square to building within instructor's time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT

The student will:
- erect carpenters' wall brackets securely fastened behind wall studs and within proper span, determined by size of planks, within instructor's time limit.
- determined by existing conditions and slope of roof, the student will erect necessary scaffolding to place ridge and erect rafters.
The student will:
- secure (2/3) rafters to same side of ridge section
  - raise and brace section
  - secure rafters to plate
  - place and fasten opposite rafters to ridge and plate
  - plumb and finish brace section
  - fill in remaining rafter locations maintaining ridge line
	Information sheets:
	Scaffolding
	
	Discuss: Nailing
	Crowning
	Scaffolding
	Safety

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: ROOF FRAMING

TASK: LAY OUT AND CUT COMMON RAFTERS

MAJOR OBJECTIVE

The student will select materials, tools, and equipment and lay out and cut one pair of common rafters using the step and line method according to instructor's standards and time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - set stops on framing square to determined run and rise - step off required number of times as per plan or as directed - calculate line length of rafter using rafter table on framing square - locate, plumb, seat, and tail cuts - shorten rafter at ridge (plumb cut) - cut pair of common rafter - calculate rise and run of a common rafter - identify common rafter terminology	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: ROOF FRAMING

UNIT: CARPENTRY

TASK: INSTALL CEILING JOIST AND BACKING

CODE:

MAJOR OBJECTIVE

Given tools and material, the student will install ceiling joist and necessary backing for nailing ceiling material, according to the instructor's specified time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - crown and place joist on proper symbol - toe nail joist to top plate and at point of bypass - place and fasten backing at all ceiling corners where needed	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: ROOF FRAMING

TASK: STUD AND SHEATH THE GABLE END

MAJOR OBJECTIVE

Given the tools and materials, the student will stud and sheath the gable end wall according to building standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - layout stud locations to building standards - layout story-pole to determine correct stud length - cut studs at correct angle and length - toe nail stud into place without drifting beyond mark and raising rafter - install wall sheathing to gable end wall at correct pitch of roof	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: ROOF FRAMING

UNIT: CARPENTRY

TASK: APPLY ROOF SHEATHING

CODE:

MAJOR OBJECTIVE

The student will select tools and materials and estimate and apply sheathing to a roof according to trade standards and teacher's specified time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - calculate amount of material needed to cover roof - snap line at proper location full length of roof - apply sheathing to specifications	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: ROOF FRAMING
CODE:

STUDENT NAME:
SCHOOL YEAR:

☐ MET MAJOR OBJECTIVE
DATE COMP.
☐ NEEDS FURTHER INSTRUCTION

CONDITIONS: Live, full scale or actual construction

TASK:	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	
1. Install ceiling joist and backing						
2. Identify component parts of a gable roof						
3. Layout top plate and ridge						
4. Step off and cut one pair of common rafters						
5. Set scaffold and erect roof section						
6. Layout, cut and nail studs to gable end and sheath						
7. Estimate material and apply sheathing to roof						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: ROOF COVERING

TASK: APPLY STRIP SHINGLES

MAJOR OBJECTIVE

The student will select necessary tools, equipment and material and will apply strip shingles according to trade standards and manufacturer specifications within the instructor's time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - erect necessary scaffold - estimate material need - identify two weight range applications and various tab types - apply 15 lb. felt parallel to roof drip edge and free of wrinkles - apply drip edge around entire perimeter of roof - first course shingles applied with tabs to ridge, stone up, properly nailed - cut and apply shingles to given roof structure - cut and apply ridge cap	1. Modern Carpentry, Unit 22, Scaffolds & Ladder 2. Pass safety test 3. Practical problems in Mathematics A) Unit 18 (Linear Measure) B) Unit 19 (Square Measure) 4. Modern Carpentry, Unit 10, Roofing Materials 5. Demonstration on roof application: Strip Shingles 1. Felt 2. Drip 3. Shingles 4. Ridge 5. Nails and staples 6. Set of blueprints 7. Pass roofing application test 8. Tool demonstrations

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: ROOF COVERINGS

UNIT: CARPENTRY

TASK: APPLY ROLLED ROOFING (HALF LAP)

CODE:

MAJOR OBJECTIVE

The student will select necessary tools, equipment, and material and will apply half lap rolled roofing according to trade standards and manufacturer's specifications within the instructor's time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - estimate material - erect scaffolding - cut to length material, cement and nail to roo - cement	1. Modern Carpentry, Unit 22, Scaffolds & Ladders 2. Pass Safety test 3. Practical Problems in Mathematics A) Unit 18 (Linear Measure) B) Unit 19 (Square Measure) 4. Modern Carpentry, Unit 10, Roofing Materials 5. Demonstration of Roof Applications Rolled roofing 1/2 lapped a) Paper b) Tar c) Nails 6. Set of Blueprints 7. Pass roofing application test 8. Tool demonstration

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: ROOF COVERING

UNIT: CARPENTRY

TASK: APPLY WOOD SHINGLES

CODE:

MAJOR OBJECTIVE

The student will select necessary tools, equipment, and materials, and will apply wood shingles according to trade standards and manufacturer's specifications within the instructor's time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - estimate square foot area of roof and woodscaps - determine exposure to weather from manufacturer's specifications - erect necessary scaffold - apply under course, properly nailed and spaced - snap chalkline for exposure to weather - apply sequential courses at determined exposures necessary to finish roof - cut and cap the ridges	1. Modern Carpentry, Unit 22, Scaffolds & Ladders 2. Pass Safety test 3. Practical Problems in Mathematics A) Unit 18 (Linear Measure) B) Unit 19 (Square Measure) 4. Modern Carpentry, Unit 10, Roofing Materials 5. Demonstration of roof application Wood Shingles 1. Shingles 2. Nails 6. Set of blueprints 7. Pass roofing applications test 8. Too demonstration 9. Cedar Shingles Institute - Handbook

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: ROOF COVERING

TASK: INSTALL FLASHING VALLEY, CHIMNEY AND DORMERS

MAJOR OBJECTIVE

The student will select necessary tools, equipment and materials and will install flashing at a valley, chimney, and dormer according to trade standards and within the instructor's specified time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - cut, bend, and apply step flashing - identify and list advantages and disadvantages of two common flashing materials	1. Modern Carpentry, Unit 10, Roofing 2. Demonstration of flashing installation A. Hip B. Valley C. Ridge Cap D. Dormer E. Chimney 1. cricket & saddles F. Eaves (Show slides) 3. Set of blueprints 4. Pass flashing test 5. Flashing materials samples 6. Tool Demonstration 7. Pass safety test

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: EXTERIOR FINISH

UNIT: CARPENTRY

TASK: IDENTIFY TYPES, MEMBERS AND MATERIALS USED IN CORNICE CONSTRUCTION

CODE:

MAJOR OBJECTIVE

The student will identify 3 of 4 types of cornices, identify cornice members for each type selected, and identify 5 cornice materials used in cornice construction within instructor's acceptable time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will be able to identify and list: - types of cornices - cornice members - cornice materials	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: EXTERIOR FINISH

TASK: IDENTIFY STYLES OF SIDING AND MATERIALS USED FOR EXTERIOR WALL FINISH

MAJOR OBJECTIVE

The student will identify three styles of siding and four types of materials, and outline application methods of three styles and one type of material for each style to instructor's acceptable time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify three styles of siding - list three styles of siding - identify four types of materials - list four types of material - outline application methods of three styles using one type of material for each style	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: EXTERIOR FINISH

UNIT: CARPENTRY

TASK: INSTALL WONDOWS AND DOORS

CODE:

MAJOR OBJECTIVE

The student will select tools, equipment and nails, select door and window units from plans and specifications to match rough openings, set and center in openings, level sill and plumb side casing so that the level bubble is within the two lines of the vile, shim unit until shims are snug and nail according to trade standards and instructor's time limit.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - select window and/or door from plans and specifications - set and center unit in opening - level and shim unit - plumb and nail unit	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: EXTERIOR FINISH

UNIT: CARPENTRY

TASK: APPLY SHINGLES

CODE:

MAJOR OBJECTIVE

The student will select tools, equipment and material and cut, fit & apply one (1) type of shingle, plumb, level and fastened according to manufacturer's specifications.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - select tools and equipment - select material - cut, fit and apply shingles	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: EXTERIOR FINISH

UNIT: CARPENTRY

TASK: INSTALL HORIZONTAL SIDING

CODE:

MAJOR OBJECTIVE

The student will select tools, equipment and materials, and cut and apply one type of siding material, and fasten according to manufacturer's specifications. Quantity and time as per instructor's directions.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - select tools and equipment - select material - cut and apply one type of horizontal siding	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: EXTERIOR FINISH

UNIT: CARPENTRY

TASK: INSTALL VERTICAL SIDING

CODE:

MAJOR OBJECTIVE

The student will select tools, equipment and materials, and will cut and apply (1) type of vertical siding, and plumb and fasten according to manufacturer's specifications. Quantity and time as per instructor's determination.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - select tools and equipment - select material - cut and apply (1) one type of vertical siding	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: EXTERIOR FINISH

UNIT: CARPENTRY

TASK: INSTALL BOX CORNICE

CODE:

MAJOR OBJECTIVE

The students will select tools, equipment and materials and construct a box cornice, straight, level, and joints open no more than 1/16" for wood or hardboard and to manufacturer's specifications with other materials to instructor's acceptable time.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - cut, install and align fascia - cut and install soffit material - cut and install molding	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: EXTERIOR FINISH
CODE:

STUDENT NAME:
SCHOOL YEAR:

☐ MET MAJOR OBJECTIVE
DATE COMP.
☐ NEEDS FURTHER INSTRUCTION

CONDITIONS: LIVE, FULL SCALE OR ACTUAL CONDITIONS.

TASK:	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs Further Instruction
1. Install windows and doors.						
2. Identify styles of siding and material used (instructor's written test.)						
3. Apply wall shingles.						
4. Install horizontal siding.						
5. Install vertical siding.						
6. Identify members and materials used in cornice construction (instructor's written test)						
7. Install box cornice						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: INTERIOR FINISH

UNIT: CARPENTRY

TASK: INSTALL DRY WALL

CODE:

MAJOR OBJECTIVE

Given tools and supplies, the student will install dry wall (Gypsum wallboard) on a given interior wall that contains switches and outlet receptacles. (complete wallboard preparation prior to spackling)

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C.
The student will: - identify the select the proper thickness & edge shape wallboard for a particular installation - properly estimate the quantity of gypsum wallboard for the installation - identify and select the proper wallboard fasteners necessary for the installation - properly install wallboard on ceiling using shores and the double nailing method - properly dimple the wallboard without breaking the composition - layout and cutout outlet receptacle locations - install wallboard horizontally on walls - properly install all types of corner bead - install double layer (two ply) wallboard application - cut gypsum wallboard - demonstrate proper methods of handling and storing gypsum wallboard - install gypsum wallboard on masonry wall - locate & install gypsum wallboard near areas where vertical structural members meet - demonstrate safety during application	Review types of tools and supplies necessary for interior wall finish using gypsum wallboard Review material estimation procedures Demonstrate gypsum wallboard installation on ceilings and walls using proper methods of handling, cutting, nailing (dimpling), and cutting for outlet receptacle locations	Page 313-319

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

MODULE: INTERIOR FINISH

CODE:

STUDENT NAME:

SCHOOL YEAR:

MET MAJOR OBJECTIVE

DATE COMPLETED

MAJOR OBJECTIVE:

Given the necessary tools and supplies the student will install dry wall (gypsum wallboard) on a given interior wall that contains switches and outlet receptacles. (Complete wallboard preparation prior to spackling)

TASK: Install drywall	Related Information	Material Selection	Tool and Equipment selection	Tool Usage	Meets Objective criteria	Needs further instruction	
1. Identify and selection of material							
2. Estimating							
3. Selection & installation of fasteners (dimpling)							
4. Ceiling coverage							
5. Wall coverage							
6. Double nailing method							
7. Cutting drywall							
8. Locate and cut for outlets							
9. Corner bead installation							
10. Two ply application							
11. Masonry wall (wallboard application)							
12. Safety							

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: INTERIOR FINISH

TASK: INSTALL WOOD PANELING

MAJOR OBJECTIVE

Given the necessary tools and materials the student will install wood paneling on a given interior wall demonstrating accuracy and craftsmanship.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - Select and identify various types of wood paneling - Estimate the materials necessary for a particular installation - Cut and install wood paneling to a given wall - Layout and cut openings for outlet receptacles - Scribe wood panel for corner installation - Demonstrate safe and proper methods of handling wood panels	Review various types of wood panels available Review estimation procedure Demonstrate proper installation of wood paneling using proper methods of nailing, cutting and scribing for corner installation

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

MODULE: INTERIOR FINISH

CODE:

STUDENT NAME:

SCHOOL YEAR:

MET MAJOR OBJECTIVE

DATE COMPLETED

MAJOR OBJECTIVE:
Given the necessary tools and materials the student will install wood paneling on a given interior wall demonstrating accuracy and craftsmanship

TASK: Install wood paneling

	Related Information	Material Selection	Tool and Equipment Selection	Tool Usage	Meets objective Criteria	Needs further instructions	
1. Selection and identification of materials							
2. Material estimation							
3. Cutting							
4. Cutting for outlet receptacles							
5. Corners							
6. Nailing							
7. Safety							

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: INTERIOR FINISH

TASK: INSTALL INTERIOR DOOR AND JAMB SET

MAJOR OBJECTIVE

Given the tools and materials the student will install an interior door and jamb set.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will:	
- Identify and select the various materials needed for proper installation	Review materials and supplies necessary for proper door & jamb set installation
- Properly install head and side jamb (plumb each side) blocking	Nomenclature of materials
- Install door casing approximately 1/4" from face of jamb	Demonstrate door frame installation using proper methods of securing side jambs perfectly plumb and casing properly installed
- Demonstrate proper nailing procedures on jamb & casing (select 4d or 6d nails along jamb) (8d along edge case to studs)	Demonstrate pre-hung door unit installation and adjusting
- Install door stops - as it applies	Demonstrate hardware installation
- Install pre-hung door unit	
- Install hinges	
- Install lock-set	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: INTERIOR FINISH

STUDENT NAME:
SCHOOL YEAR: -

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools and materials the student will install an interior door and jamb set

TASK: Install interior door frame and pre-hung door unit

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Material nomenclature						
2. Head & side jamb installation (plumb)						
3. Locate and install blocking						
4. Nailing						
5. Install casing (nailing)						
6. Install door stops						
7. Hinges						
8. Lock-set						
9. Pre-hung door unit						
10. Adjusting unit (pre-hung)						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: INTERIOR FINISH

UNIT: CARPENTRY

TASK: INSTALL PRE-FAB KITCHEN AND BATHROOM CABINETS

CODE:

MAJOR OBJECTIVE

Given the tools and materials, the student will install all types of pre-fab kitchen and bathroom cabinets.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C. Page
The student will:		
- Identify basic cabinetry styles and types	Review styles and types of cabinets	383-406
- Identify basic cabinet hardware (hinges, pulls, catches, draw guides)	Demonstrate installation of base and wall cabinets	
- Interpret cabinet layout plans		
- Align and fasten base cabinets		
- Align and fasten wall cabinets		
- Align and fasten pre-formed counter tops		

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

MODULE: INTERIOR FINISH

CODE:

STUDENT NAME:

SCHOOL YEAR:

MET MAJOR OBJECTIVE

DATE COMPLETED

MAJOR OBJECTIVE:

Given the necessary tools and materials the student will properly install all types of kitchen and bathroom cabinets

TASK: Install pre-fabricated cabinets	Related Information	Material Selection	Tool and Equipment Selection	Tool Usage	Meets objective criteria	Needs Further Instruction
1. Identification styles and types						
2. Identify hardware						
3. Align						
4. Fastening						
5. Layout plans						
6. Counter tops						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: INTERIOR FINISH

TASK: INSTALL WOOD FLOORING

MAJOR OBJECTIVE

Given the tools and materials the student will install the various types of wood flooring demonstrating skill and accuracy.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C. Page 331-339
The student will: - Identify the various types of wood flooring available (strip, plant & block) - Identify & describe the difference between all types of flooring material (asphalt, vinyl, vinyl-asbestos, rubber tile, linoleum, flagstone, slate, brick, ceramic tile, and the hardwoods using in flooring. (oak, maple, birch & beech) (softwoods-pine, fir) - Identify and select sizes, grades and types of flooring - Estimate materials necessary for installation - Install strip, plank and block wood flooring - Demonstrate & describe proper nailing techniques - Layout flooring (wood) around projections - Determine board footage - Install wood flooring over concrete - Demonstrate proper safety and tool maintenance	Review the various types of flooring available according to size, grade, and styles. Review material estimation. Demonstrate installation of strip, plank and block wood flooring on various surfaces.	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVE
DATE COMPLETED

UNIT: CARPENTRY

MODULE: INTERIOR FINISH

CODE:

MAJOR OBJECTIVE: Given the necessary tools and materials, the student will install various types of wood flooring demonstrating skill and accuracy.

TASK: Install wood flooring

	Related Information	Material Selection	Tool and Equipment Selection	Tool Usage	Meets objective Criteria	Needs further Instruction
1. Identify various types of wood flooring						
2. Describe various types of flooring material						
3. Identify the various hardwoods						
4. Identify the various softwoods						
5. Material estimation (board footage etc)						
6. Installation of strip, plank & block flooring						
7. Nailing						
8. Flooring around projections						
9. Wood flooring over concrete						
10. Safety						
11. Maintenance						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: INTERIOR FINISH

TASK: INSTALL RESILIENT FLOOR TILE

MAJOR OBJECTIVE

Given the tools and materials, the student will install the various types of resilient floor tiles.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C. Page
The student will: - identify and select the various types of resilient floor tile available (vinyl, rubber, linoleum, etc.) - Estimate materials - prepare floor for application of resilient tile flooring - layout area for flooring application - layout "dry" run of tile flooring - layout pattern of tile flooring-apply adhesive properly and install tile neatly and accurately - cut the various compositions of resilient flooring - install flooring around projections - install cove base - if applicable - maintain tools	Review types of resilient flooring Subfloor preparation floor (tile) layout Material estimation and materials necessary for application of resilient flooring Demonstrate floor layout application of adhesive, installation of tile, cutting tile, installation around projections, installation of cove base, and tool maintenance.	341-345

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COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: INTERIOR FINISH

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools & materials, the student will properly install the various types of resilient floor tiles

TASK: Installation of resilient flooring

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify materials						
2. Selection of materials						
3. Material Estimation						
4. Floor preparation						
5. Floor layout						
6. Dry run						
7. Felt application- if applicable						
8. Adhesive application						
9. Pattern layout						
10. Cutting tile						
11. Flooring around projections						
12. Installation of cove base-if applicable						
13. Maintain tools						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: INTERIOR FINISH

TASK: INSTALL INTERIOR MOLDINGS AND TRIM

MAJOR OBJECTIVE

Given the tools and materials, the student will install all types of interior molding and trim.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT M.C. Page 361
The student will: - select and identify the molding material needed for a particular job (size & grades) - select and identify the fasteners necessary for proper installation - estimate material - cut molding and trim to a given length - install baseboard, base shoe, quarter round, cove, casing, mullion casing, apron, stool, door and window stops trim and molding - adjust miter box properly for cutting a miter (cut a miter) - cape molding (as it applies)	Review types and styles of molding and trim Review material estimation Demonstrate cutting and coping all types of molding (as it applies) Demonstrate proper installation of each type of molding and trim Demonstrate safe and correct use of miter box

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COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: INTERIOR FINISH

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools & materials, the student will install all types of interior molding and trim.

TASK: Properly install all types of interior molding and trim

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Selection & identification of molding and trim						
2. Estimating						
3. Cutting to length						
4. Coping (as it applies)						
5. Install: baseboard molding						
6. base shoe molding						
7. quarter round molding						
8. cove molding						
9. casing molding						
10. mullion casing molding						
11. apron casing						
12. stool casing						
13. door & window stops						
14. miter box						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: INTERIOR FINISH

UNIT: CARPENTRY

TASK: INSTALL CERAMIC WALL & FLOOR TILE

CODE:

MAJOR OBJECTIVE

Given the tools and materials, the student will install several types of ceramic wall and floor tiles in a bathroom area.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT	M.C.
The student will: - identify and select the various materials needed for ceramic tile installation - layout pattern - if applicable - cut ceramic tile using proper cutting tools - prepare wall surface - if applicable - properly apply skim coat of tile adhesive (waterproofing) - properly apply bedding coat of adhesive - install tile properly using correct layout - apply ceramic tile on ceiling - properly apply grouting - waterproof grouting - properly maintain those tools used in application	Review material nomenclature Demonstrate proper methods of wall preparation, skim coat adhesive application, bedding coat application, tile installation, grouting, waterproofing, and tool maintenance.	Page 319-320

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: INTERIOR FINISH

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools and materials, the student will install several types of ceramic wall and floor tiles in a bathroom area.

TASK: Install ceramic wall & floor tile

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Material nomenclature						
2. Pattern layout-if applicable						
3. Cut ceramic tile						
4. Wall preparation						
5. Skim coat - adhesive						
6. Bedding coat - adhesive						
7. Tile installation						
8. Ceiling						
9. Grouting						
10. Waterproof grouting (sealer)						
11. Tool maintenance						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: CARPENTRY

CODE:

MODULE: INTERIOR FINISH

TASK: LAYOUT AND INSTALL SERVICE AND MAIN STAIRWAY

MAJOR OBJECTIVE

Given the tools and materials, the student will layout, construct and install a service and main stairway.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - describe those terms and definitions associated with stairway construction tread, riser, stringer, unit run, unit rise, total run, total rise, stairwell rough opening, preferred angle and headroom - identify the various types of stairs - stair installation - layout stringer (or carriage) - calculate the number & size of risers & treads - install stringer, treads & risers, (layout cut and assemble) - estimate materials needed - select the proper tools necessary for stair installation. - frame stairwell	M,C. Page 349-359 Review types of stairs, materials, terms and supplies necessary for stair installation Review tread, riser, and material estimation calculations Demonstrate stringer, layout and installation of tread and risers Review & demonstrate framing of stairwell

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: INTERIOR FINISH

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools and materials the student will layout, construct and install a service and main stairway.

TASK: Properly layout and install service and main stairway.

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Definition of terms						
2. Identify types of stairs						
3. Material estimation						
4. Tool selection						
5. Stairwell framing						
6. Stringer layout						
7. Tread installation						
8. Riser installation						

FORWARD

The electrical unit of the Building Industries Occupations program deals mainly in the residential wiring area. It was designed to provide the basic skills required for entry level employment in this area.

Throughout the development of this material, much care was taken to leave the acceptable standards to the discretion of the instructor. It should be noted however, that in some instances minimum standards must be met in order to successfully complete a major objective.

It should be noted that the Suggested Instructional Content sections seem to be somewhat deficient. This was intentional on the part of the developers to allow as much leeway as possible to the individual instructors' method of teaching.

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: ORIENTATION

TASK: DESCRIBE ELECTRICAL INDUSTRY

MAJOR OBJECTIVE

The student will describe:

1. The sub-divisions of the electrical industry
2. The benefits and employment opportunities available in the electrical industries.
3. The general goals of the residential wiring module.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: 1. Breakdown the electrical industry into major subdivisions. 2. List the benefits provided by the electrical industry. 3. Describe the local apprentice/training programs available through: A. Unions B. Industry C. Non-union contractors D. Electrical supply houses E. Veteran's Administration 4. Describe the general goals of the residential wiring module.	1. View IBEW film "Genesis of a Giant" A. Color. 28 minutes. This is the story of apprenticeship in the electrical construction industry, as administered by the Joint Apprenticeship and Training Committees of the National Electrical Contractors Association and the IBEW.

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: CARPENTRY
MODULE: ORIENTATION

STUDENT NAME:
SCHOOL YEAR:

REVISED
1/15/77

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the proper orientation, the student will describe: 1. Sub-divisions of the electrical industry, 2. Benefits & employment opportunities, 3. General goals of the residential wiring.

TASK: Orientation module

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Breakdown the electrical industry into major sub-divisions		NA	NA	NA		
2. List benefits		NA	NA	NA		
3. Describe apprentice and training programs		NA	NA	NA		
4. Describe the general goals of the residential wiring module.		NA	NA	NA		

Name _____
Session _____

ASSESSMENT
ORIENTATION CRM

1. Breakdown the electrical industry into as many subdivisions as you can.

2. List the benefits available to workers in the electrical industry.

3. Describe apprentice and other training programs available in the electrical industry.

4. Describe the general goals of the residential wiring module.

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: CIRCUITRY

TASK: DEFINE AND CONSTRUCT SERIES AND PARALLEL CIRCUIT

MAJOR OBJECTIVE

Given the necessary tools and materials, the student will define by writing or stating verbally, and construct a series and a parallel circuit that work.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Given components and diagram, the student will define and construct a series circuit so that there is only one conductor connected to each end of a component and the components are connected end to end. Given the necessary information, components and diagram, the student will define and construct a parallel circuit so that with the exception of the switch, one end of each component is connected to one side of the source and the other end of each component is connected to the other side of the source and the switch is in series with all the components. Given a group of 20 electrical point to point diagrams, the student will label each a series or a parallel circuit.	Define: Voltage- Current- Resistance, Circuit- (Open) - (Closed)- (Short)- Path Describe: Characteristics of Parallel circuit: Indicate constant voltage - decreasing resistance, and increasing current

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools and materials, the student will define by writing or stating verbally, and construct a series and a parallel circuit that work.

TASK: Series and parallel circuit recognition and construction

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Write or state definition of series circuit.						
2. Construct series circuit						
3. Write or state definition of parallel circuit						
4. Label example circuits correctly						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: CIRCUITRY

TASK: SELECT CONDUCTOR TYPE AND SIZE FOR THE RESIDENCE

MAJOR OBJECTIVE

The student will select the correct conductor type and size for the residence in accordance with NEC and local code standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - Define common trade terms used in conjunction with conductors: load, conductor, Romex ampacity, insulator, BX voltage, AWG, Home run - Describe the types of cables used in residential installation: non-metallic sheathed cable metallic sheathed cable range cable service entrance cable UF cable - List the installation requirement for each type of cable as specified in the NEC. - List the ampacity of copper conductors used in residential wiring: wire — ampacity #14 AWG — 15 #12 AWG — 20 #10 AWG — 30 # 8 AWG — 40 # 6 AWG — 55	Refer to N.E.C.-conductor insulation and use Cover N.E.C. rules Describe where each is used in a residential installation

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: CIRCUITRY

TASK: SELECT CONDUCTOR TYPE AND SIZE FOR THE RESIDENCE

(cont)

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Given the example circuits listed below of residential wiring, the applicable NEC article and table, the student will be able to select the correct conductor size, ampacity rating, and insulation type for each in a time period specified by the instructor. Lighting circuit Small appliance Dryer circuit Range circuit Outside circuit 100 amp. entrance service 150 amp. entrance service 200 amp. entrance service Fixed appliance circuit	Define each of the listed circuits and where each is used

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COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: The student will select the correct conductor type and size for the residence in accordance with the N.E.C. and local code standards.

TASK: Selecting conductor type and size for residence.

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
~~Define by writing or stating verbally~~ the definition of:						
1. Load						
2. Ampacity						
3. Voltage						
4. Conductor						
5. Insulator						
6. AWG						
7. Romex						
8. BX						
9. Home run						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: The student will select the correct conductor type and size for th residence in accordance with the N.E.C. and local code standards.

TASK: Selecting conductor type and size for residence.

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
Write or state description of NEC installation requirements for:						
1. Non-metallic sheathed cable						
2. Metallic sheathed cable						
3. Range cable						
4. Service entrance cable						
5. U.F. Cable						
Write or state maximum ampacity for:						
6. #14 AWG						
7. #12 AWG						
8. #10 AWG						
9. # 8 AWG						
10. # 6 AWG						
Select conductor for:						
1. Lighting circuit						
2. Small appliance circuit						
3. Dryer circuit						
4. Range circuit						
5. Outside circuit						
6. Service entrance circuit						
7. Fixed appliance						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: CIRCUITRY

TASK: LAYOUT ELECTRICAL OUTLETS IN A RESIDENCE

MAJOR OBJECTIVE

The student will layout the electrical outlet locations in a residence, in accordance with the N.E.C., local code and local wiring practice.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify common electrical symbols used in residential wiring - utilize the N.E.C. as a minimum standard for outlet location, mark outlet location on stud or floor	Refer to Delmar's Electrical Wiring- Residential Describe N.E.C. Requirements

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: The student will layout the outlet locations in a residence, in accordance with the N.E. C. and local code and local wiring practice.

TASK: Layout outlets

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Draw electrical symbols used in residential wiring						
2. Layout electrical outlet on a floor plan						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: CIRCUITRY

TASK: INSTALL ELECTRICAL OUTLET BOXES IN A RESIDENCE

MAJOR OBJECTIVE

Given materials, the student will install electrical outlet boxes in a residence according to NEC and local code.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify various types of outlet boxes used in a residence - locate outlet boxes in the residence in accordance with code requirements and local wiring practices - "gang" metal boxes - select the proper size box used in the residence, in relation to the number of conductors contained according to article 370-6 of the NEC	Discuss metal and plastic boxes and N.E.C. governing each Discuss size and number of conductors in a box. Also cover various alternatives for outlet installation with regard to box selection

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: The student will install outlet boxes in a residence according to N.E.C. and local code.

TASK: Install outlet boxes

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify outlet boxes in a residence						
2. Locate outlet boxes in a residence						
3. Gang metal outlet boxes						
4. Select the proper outlet box according to number of wires in the box						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: CIRCUITRY

UNIT: ELECTRICAL

TASK: (ROUGH-IN) INSTALL CABLE IN RESIDENCE

CODE:

MAJOR OBJECTIVE

Given materials, the student will install non-metallic cable/metallic cable in a residence according to the N.E.C. and local building code.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - drill holes in the center of the studs in preparation for installing cable - identify the various sizes of non-metallic sheathed cable/armoured cable used in the residence - staple cable in accordance with N.E.C. and local codes - strip and install cables	Discuss safety precautions to be followed when using drill Cover types of drills and bits available Discuss various types of stripping tools

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the materials, the student will install non-metallic cable/ metallic cable in a residence according to the N.E.C. and local building code.

TASK: Install cable

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Drill holes in the studs						
2. Identify sizes of non-metallic/ metallic cable						
3. Staple cable						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: CIRCUITRY

UNIT: ELECTRICAL

TASK: INSTALL SWITCHES IN A RESIDENCE

CODE:

MAJOR OBJECTIVE

Given materials, the student will complete a schematic diagram, wiring diagram, cable layout and will install a single-pole, 3-way, 4-way, split circuit, pilot and dimmer switches in a residence, within N.E.C. and local code standards as specified by the instructor.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - draw the various electrical symbols used on schematic diagrams, wiring diagrams and cable layouts. - write or state the operating characteristics of: a) single-pole switch b) three-way switch c) four-way switch d) switch w/pilot e) dimmer switch - write or state the definition of new common terms used in electrical circuitry: a) switchloop b) traveler c) feed d) return e) neutral f) hot leg g) split-circuit h) grounding wire - draw a schematic wiring diagram, cable layout & install the following circuits: a) a light controlled by a single pole switch with the feed at the switch b) a light controlled by a single pole switch with the feed at the light c) a light controlled by a single pole switch with a receptacle outlet down circuit operating independent of the single pole switch	Discuss amperage and voltage ratings and types of switches. Suggest a circuit be designed that would include all of the listed terms. Student should be checked at each interval (schematic-cable layout (wiring diagram) and installation). Installation should be as close to actual work as possible.

(continued)

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: CIRCUITRY

TASK: INSTALL SWITCHES IN A RESIDENCE (cont)

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
d) a light to be controlled from two locations by three-way switches with the feed at one of the switches e) a light to be controlled from two locations by three-way switches with the feed at the light f) a light to be controlled from three locations by three-way and four-way switch with: feed at the switch feed at the light g) a light to be controlled by a single pole switch with a pilot light to indicate when the light is energized h) a split-circuit convenience outlet, the bottom portion of the receptacle to be switch controlled, the top portion to be "hot" all the time i) a light controlled by a dimmer switch both: 1. single-pole switching situations 2. three-way switching situations	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given materials, the student will complete a schematic diagram, wiring diagram & cable layout & will install a single-pole, 3-way, 4-way, split circuit, pilot switches, dimmer switches in a residence, within N.E.C. and local code standards as specified by the instructor
TASK: Install switches in a residence

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Draw electrical symbols						
Write or state operation of:						
2. Single pole switch						
3. 3-way switch						
4. 4-way switch						
5. Pilot switch						
6. Dimmer switch						
Write or state definition of:						
7. Switchloop						
8. Traveler						
9. Feed						
10. Return						
11. Neutral						
12. Hot Leg						
13. Split-circuit						
14. Grounding Wire						
(continued)						

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

(cont)
Given materials, the student will complete a schematic diagram, wiring diagram & cable lay-out & will install a single-pole, 3-way 4-way, split circuit, pilot switches, dimmer switches in a residence, within N.E.C. & local code standards as specified by the instructor

TASK: Install switches in a residence	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
15. Install light controlled by single pole switch feed at switch						
16. Install light controlled by single pole switch feed at light						
17. Install light controlled by switch with convenience outlet to remain hot						
18. Install light controlled from 2 places with feed at switch						
19. Install a light controlled from 2 places feed at light						
20. Install a light controlled from 3 places A) feed at switch						
B) feed at light						
21. Install pilot switch						
22. Install split convenience						
23. Install dimmer switch for single pole						
24. Install dimmer switch for three-way						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: CIRCUITRY

TASK: INSTALL SMALL APPLIANCE CIRCUIT

MAJOR OBJECTIVE

Given materials, the student will layout and install small appliance circuitry in the residence as required by the N.E.C.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - draw a schematic diagram, wiring diagram and cable layout of small appliance circuits required in a residence from a floor plan - list the N.E.C. requirements for small appliance circuits in the residence - layout & install a multi-wire circuit in accordance with section 300-13 of the N.E.C. - Layout & install a split-circuit (two circuit) convenience outlet circuit in a kitchen residence	Cover small appliance circuit installation with regard to amperage and wattage ratings

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given materials, the student will layout and install small appliance circuitry in the residence as required by the N.E.C.

TASK: Small appliance circuitry installation

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Draw the schematic diagrams for the small appliance circuits						
2. Draw the wiring diagrams for the small appliance circuits						
3. Draw the cable layout for the small appliance circuits						
4. List the N.E.C. requirements						
5. Install a multiwire circuit						
6. Install a split circuit						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: CIRCUITRY

UNIT: ELECTRICAL

TASK: SELECT AND INSTALL SPECIAL PURPOSE OUTLETS

CODE:

MAJOR OBJECTIVE

Given the necessary tools and material, the student will select and install special purpose outlet circuits according to the N.E.C., local codes, and trade standards, in a time specified by the instructor.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - determine and select wire and cable size - determine and select fuse or circuit breaker size - install the wire, boxes, clamps necessary to wire the special purpose outlet according to trade standards - make proper grounding and wiring connections	Lectures and demonstrations National Electric Codes Handout sheets Discuss fixed appliance load demand

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: CIRCUITRY

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools and materials, the student will select and install special purpose outlet circuits according to the N.E.C., local codes & trade standards, in a time specified by the instructor.

TASK: Select & install special purpose outlets

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Determine & select wire and cable size.						
2. Determine & select fuse or circuit breaker size.						
3. Install wire, boxes, clamps.						
4. Install range outlet.						
5. Install dryer outlet.						
6. Install freezer outlet.						
7. Install washer outlet.						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: OVERHEAD SERVICE ENTRANCE

UNIT: ELECTRICAL

TASK: INSTALL AN OVERHEAD SERVICE

MAJOR OBJECTIVE

Given service entrance material, service entrance and the necessary tools to install a service entrance using service entrance cable, the student will safely install an overhead service, according to the N.E.C. and local utility specifications.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
- Given service entrance cable, the student will measure out and strip the covering from the cable for a service entrance drop, meeting with the instructor's approval - Given the prepared service entrance cable, a weather-head, clamps, and proper fittings, the student will install the service entrance cable and weather-head on the side of a building according to the N.E.C. and local codes - Given a meter socket, necessary fittings and tools, the student will install the service entrance cable into the meter socket and then secure the socket to the wall according to utility specifications. - Given service entrance cable, the student will: a) measure, cut and strip covering from the cable used to go from the meter socket to the main distribution panel, meeting with the instructor's approval b) take this cable, clamps and proper fittings and install the service entrance cable to the meter socket and to the power distribution panel according to the N.E.C. and local codes (continued)	- Lecture and demonstration on how to install an overhead service using service cable - Display and explain tools and equipment to do a service entrance using service cable - Explain power distribution from public utility - Explain Underwriters Inspection application forms - Wire the overhead service entrance using service entrance cable

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: OVERHEAD SERVICE ENTRANCE

TASK: INSTALL AN OVERHEAD SERVICE (cont)

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
- The student will identify in writing and/or application evaluation (selected or all) required items of an overhead service entrance (cable type) within instructor's criterion. - Given a current code book and instruction for ampacity of service entrance cables, the student will find the maximum ampacity of selected wire sizes according to the N.E.C. and within instructor's criterion. - The student will be able to identify and state in writing or application evaluation (selected or all) required tools necessary to install an overhead service (cable type)and within instructor's criterion. - The student will demonstrate proper safety procedure in: (1) personal safety (2) ladder safety (3) select of tools and materials (4) tool use in compliance with OSHA standards	- Discuss and lecture on examples shown in text book and chapter #9 of N.E.C.

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: OVERHEAD SERVICE ENTRANCE

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given service entrance material, service entrance, & the necessary tools to install a service entrance (cable type) the student will install an overhead service safely, according to the N.E.C. and local utility specifications.

TASK: Install Overhead Service Entrance (Cable)

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Cable preparation (measuring, cut & strip covering)						
2. Install service entrance cable & weatherhead to a building						
3. Install meter socket						
4. Install cable from meter socket to power distribution panel						
5. Identify required service entrance material						
6. Find ampacity of selected wire sizes						
7. Identify & state use of tools						
8. Demonstrate proper safety procedures						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: OVERHEAD SERVICE ENTRANCE

TASK: INSTALL A MAST TYPE OVERHEAD SERVICE

MAJOR OBJECTIVE

Given service entrance and materials and the necessary tools to install a mast type service entrance, the student will cut, ream, thread, conduit and install a mast type overhead service according to N.E.C., local codes, and local utility specifications.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
- Given a selection of rigid conduit and the necessary tools, the student will measure and cut rigid conduit to an appropriate length (as set by instructor) for a mast type service entrance meeting with trade and instructor's standards. - Using conduit, conduit dies and reamer, the student will remove any burrs from conduit openings with the proper reamer and then thread the conduit ends with the proper threader meeting the instructor's standards. - Using conduit, weatherhead, meter socket, and conduit, and weatherhead to the building, meeting the N.E.C., local codes, and local utility specifications. - Using conduit, entrance ell, necessary supports, fasteners and tools, the student will install the conduit, entrance ell to the building, meeting the N.E.C., local codes, and local utility specifications. - Given a selection of wire, the student	- Information sheets Lecture National Electric Codes Teacher Demonstrations: 1. the necessary tools, and equipment used to cut, ream and thread rigid conduit.

(continued)

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: OVERHEAD SERVICE ENTRANCE

TASK: INSTALL A MAST TYPE OVERHEAD SERVICE

(cont)

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
will select, feed and connect the wire in the service entrance drop, meeting with NEC, local codes, and local utility specifications. - The student will identify in writing or application evaluation (selected or all) required items of a mast type overhead service entrance within instructor's criterion. - The student will be able to identify and state in writing or by application all required tools necessary to install an overhead service entrance (mast type) within instructor's criterion. - The student will demonstrate his ability to use the correct tools on a mast type service entrance as per instructor's criterion. - The student will demonstrate his ability to practice safe work habits and good housekeeping habits by complying with OSHA standards returning all tools and material to their proper place and cleaning his work area.	2. Demonstrate in securing conduit in wire 3. Show student a hacksaw and explain (a) frame, (b) blades (no. of teeth), (c) installation of blade, (d) proper use of hacksaw 4. Show students a pipe reamer and demonstrate its use 5. Show students a stock and die set and explain (a) National Pipe thread, (b) explain and demonstrate the proper method of cutting male threads using a stock and die set 6. Explain the purpose of the NEC and the articles pertaining to rigid steel conduit

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: OVERHEAD SERVICE

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given service entrance and materials and the necessary tools to install a mast type service entrance, the student will cut, ream, thread conduit & install a mast type overhead service according to N.E.C., local codes, and local utility specifications

TASK: Install mast overhead service	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs Further Instruction
1. Measure & cut conduit for mast type service entrance						
2. Thread & ream conduit for mast type service entrance						
3. Install meter socket, conduit & fittings for mast type entrance service						
4. Pull & connect the conductors for the mast type service						
5. Identify parts of a mast type service						
6. Demonstrate safe work habits						
7. Demonstrate good housekeeping						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: LATERAL SERVICE ENTRANCE

UNIT: ELECTRICAL

TASK: INSTALL AN UNDERGROUND SERVICE

CODE:

MAJOR OBJECTIVE

Given the necessary tools and materials, the student will install an underground service entrance in accordance with the NEC and local code regulations in a time to be specified by the instructor.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
- Given the necessary information, the student will locate the meter socket on the proper position on the house, meeting the NEC, local codes utility and instructor's specifications. - Given the necessary information, the student will be able to determine proper depth of a trench meeting with NEC, local codes, utility and instructor's specifications. - Given the necessary tools, materials, and information, the student will install conduit, fittings, and anchors necessary at both ends of the underground service and power distribution panel meeting the NEC, local codes utility and instructors specifications. - Given the necessary tools, material and information, the student will feed and connect the cable in the meter panel meeting with NEC, local codes utility and instructors specs. - Given the necessary tools, materials and information, the student will feed the cable through the conduit at the pole end to proper trade requirements. - Given the necessary tools, materials, and information, the student will connect the wires going from the meter socket to the power distribution panel meeting with NEC, local codes utility and instructor's specifications. - Given the necessary tools, materials and information, the student will ground and bound underground services meeting with NEC, local codes utility and instructor's specifications.	- Lectures and demonstrations - Explain where to locate meter 1. information from power company 2. depth of trench 3. conduit protection of cable 4. coil of wire or pole to proper length - Explain NEC that apply to job - Handout sheets - Individual learning activities - Show and discuss meter socket and rules set forth by local power company for underground service entrance (lectures and demonstrations)

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: LATERAL SERVICE ENTRANCE

MAJOR OBJECTIVE: Given the necessary tools and materials, the student will install an underground service entrance, in accordance with the NEC local code regulations in a time to be specified by the instructor

TASK: INSTALL AN UNDERGROUND SERVICE

PROCESS RATING SCALE

INSTRUCTIONS: This scale enables the student to be rated on separate process skills for each task within a module. The skills are rated on a scale from Poor (1) to Excellent (5).

	Major Objective: Task:	Inad 2	Fair 3	Good 4	Excel 5	Major Objective: Task:	Inad 2	Fair 3	Good 4	Excel 5
SKILLS	1. Locate Meter					SKILLS				
	2. Determine proper depth of trench									
	3. Install conduit, fittings & anchor used in the service									
	4. Connect the cable in the meter panel									
	5. Install cable									
	6. Meets code requirements									
SKILLS	Major Objective: Task:	Inad 2	Fair 3	Good 4	Excel 5	Major Objective: Task:	Inad 2	Fair 3	Good 4	Excel 5
						SKILLS				

MEETS CRITERION OF MAJOR OBJECTIVE ☐

DATE: _____

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: MAIN AND SUB PANEL

UNIT: ELECTRICAL

TASK: DETERMINE PANEL SIZE AND CIRCUITS

CODE:

MAJOR OBJECTIVE

Given the electrical load requirements and a floor plan, the student will determine the panel size and number of double and single pole circuits required for a residence in accordance with the N.E.C. and local code regulations.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Given the appropriate N.E.C. rule, the student will: - be able to calculate the minimum number of 120 volt lighting circuits required for some example installations with 100% accuracy	A. Lecture and demonstrations plus example calculations
Given the floor plan and the applicable N.E.C. rule, the student will: - be able to determine the minimum number of small appliance branch circuits required for some example circuits with 100% accuracy	B. Lecture and demonstrations C. Lecture and demonstrations D. Lecture and work problems
Given the floor plan and the applicable symbols, the student will: - be able to identify and determine the number of special purpose outlets required for some example installations with 100% accuracy	
Given the load requirements, the number of branch and special purpose circuits, the student will: - be able to calculate the minimum size service panel and main breaker required for some example installations with 100% accuracy	
Given some example locations for main and sub panel and the N.E.C. book, the student will: - be able to locate the applicable N.E.C. rule for each example to the instructor's satisfaction	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: MAIN & SUB PANEL

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVES: Given the electrical load requirements and a floor plan, the student will determine the size panel and the number of double and single pole circuits required for a residence in accordance with the NEC and local code regulations. TASK: Determine panel size & circuits	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Calculate the number of lighting circuits						
2. Calculate the number of small appliance branch circuits						
3. Determine the number of special purpose outlets						
4. Calculate the size of panel required						
5. Determine the location for the main and sub-panel						
6. Refer to NEC and local codes in completing assignment						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: MAIN AND SUB-PANEL

UNIT: ELECTRICAL

TASK: INSTALL AND BOND PANEL

CODE:

MAJOR OBJECTIVE

Given the necessary tools and materials, the student will install and bond the residential main and sub-panel in accordance with the N.E.C., local codes, and trade standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
- Given the necessary instruction, the student will select the appropriate tools needed to install a main distribution panel in 10 minutes	A. Show proper tools
- Using the appropriate tools, the student will mount the main distribution panel so that the panel is level and square and the completed installation is in compliance with the N.E.C. and local codes as well as trade time standards	B. Lecture and show
- Given the instruction and the N.E.C. book, the student will be able to locate the applicable N.E.C. table and select from it the correct size bonding conductor needed for every size residential distribution panel in 15 minutes	C. Lecture and show
- Given the necessary instruction, the student will select the necessary bonding clamps and bushings required to bond the service entrance equipment	D. Lecture
- Given the instruction, the student will install the bonding conductor and jumpers in compliance with the N.E.C. and local code in a length of time acceptable to the instructor	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: MAIN & SUB PANEL

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools and materials, the student will install and properly bond the residential main and sub-panel in accordance with N.E.C and local code and in a manner acceptable to trade standards. TASK: Install and bond panel	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Mount main distribution panel						
2. Bonds service entrance panel & equipment						
3. Refers to N.E.C. and local code to complete assignment						

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COURSE: BUILDING INDUSTRIES OCCUPATION

UNIT: ELECTRICAL

CODE:

MODULE: MAIN & SUB-PANELS

TASK: SELECT AND INSTALL FUSE/CIRCUIT BREAKER

MAJOR OBJECTIVE

Given the electrical requirements (voltage, current, wattage rating, location), the student will select and install the appropriate fuse/circuit breaker for all circuits in a residence in accordance with N.E.C. standards

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: 1. Define the functions of fuses/circuit breaker 2. Select the proper fuse/circuit breaker for: A. lighting circuit B. small appliance circuit C. special purpose outlet circuit D. outdoor circuit E. service entrance 3. Install the proper fuse/circuit breaker for: A. lighting circuit B. small appliance circuit C. special purpose outlet circuit D. outdoor circuit E. service entrance	A. Discuss Article 100-OF NEC (Definition) B. Lecture

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: MAIN & SUB-PANEL

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the electrical requirements (voltage, current, wattage rating, location) the student will select and install the appropriate fuse/circuit breaker for all circuits in a residence in accordance with N.E.C. standards.

TASK: Fuse/circuit breaker selection

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Define the function of fuses/circuit breakers.						
2. Select the proper fuse/circuit breaker for:						
A. lighting circuit						
B. small appliance circuit						
C. special purpose outlet circuit						
D. outdoor circuit						
E. service entrance						
3. Install the proper fuse/circuit breaker for:						
A. lighting circuit						
B. small appliance circuit						
C. special purpose outlet circuit						
D. outdoor circuit						
E. service entrance						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: SIGNALING & REMOTE CONTROL DEVICES

UNIT: ELECTRICAL

TASK: INSTALL SIGNAL CIRCUIT

CODE:

MAJOR OBJECTIVE

Given the necessary tools and materials, the student will draw a schematic wiring diagram and cable layout and safely install at least two different doorbell and two different alarm circuits in accordance with the N.E.C. & Local Codes in a time period determined by the instructor.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
- Given the symbols for each of the following electrical devices and the device itself the student will identify each by drawing the symbol and pictorial diagram for each to include labeling of the component parts, in a time period specified by the instructor. 1. Transformer 2. Doorbell 3. Normally open push button 4. Relay 5. Normally open contact 6. Normally closed contact 7. Magnetic switch 8. Thermostat - Given 5 multi-conductor cables the student will identify each to include conductor size and number of conductors in not more than 5 minutes total. - Given the following desired electrical outcomes and a floor plan for each instance the student will draw a schematic, wiring and cable layout for each so that the circuit works electrically, the connections are properly shown and a minimum amount of material is wasted, in a time	A. Hand out symbol sheet See sample attached B. Discuss multi-wire cable, to include wire size and ampacity

(continued)

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: SIGNALING & REMOTE CONTROL DEVICES

TASK: INSTALL SIGNAL CIRCUIT (CONT)

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
period specified by the instructor. 1. Doorbell controlled from two places 2. Two chimes in parallel controlled from two places. 3. Open circuit - 6 window - a door burglar alarm 4. Closed circuit - 6 window - 2 door burglar alarm 5. 1 Electric Heater Thermostatically controlled	A. Show chimes and doorbells B. Show push buttons
- Given the necessary tools, equipment and a cable layout for each of the following example circuits, the student will install the circuit in accordance with N.E.C. and local codes, so that there is a minimum amount of wasted material and the completed installation is neat and orderly by: 1. Marking component locations 2. Drilling holes for cable runs 3. Running and securing cable 4. Mounting components 5. Making proper connections in a time period specified by the instructor 1. Doorbell controlled from two places 2. Two chimes in parallel controlled from two places 3. Open circuit - 6 window - 2 door burglar alarm 4. Closed circuit - 6 window - 2 door burglar alarm	A. Discuss and show student proper trade method for installing low voltage signaling and remote control devices. B. Refer student to text book on remote control systems.

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COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: SIGNAL & REMOTE CONTROL DEVICES

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools, materials, and instruction, the student will draw a schematic wiring diagram and cable layout and safely install at least two different alarm circuits in accordance with the N.E.C. & local codes in a time period determined by the instructor.

TASK: Install signal circuit	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Identify symbols, draw diagrams and label parts of electrical components						
2. Identify cables for wire size and number of conductors						
3. Draw schematic and wiring diagrams and cable layouts for:						
a) doorbell control from two locations						
b) two chimes in paralliel controlled from two locations						
c) open circuit-6 window-2 door burglar alarm						
d) closed circuit -6 window- door burglar alarm						
e) one electric heater thermostatically controlled						
4. Install a doorbell controlled from two locations						
5. Install two chimes in parallel controlled from two locations						

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: SIGNAL CIRCUIT INSTALLATION
(cont)

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: (continued from previous page) TASK: Install signal circuit	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
6. Install open circuit-6 window-2 door burglar alarm.						
7. Install closed circuit-6 window 2 door burglar alarm.						
8. Install an electric heater thermostatically controlled						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: SIGNAL & REMOTE CONTROL DEVICES

TASK: INSTALL REMOTE CONTROL

MAJOR OBJECTIVE

Given the necessary tools and equipment the student will draw a schematic wiring diagram and cable layout and safely install at least 4 example circuits and a 5 load master control station (low voltage control) in accordance with N.E.C. and local codes in a time period determined by the instructor.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
- Given the symbols for each of the following electrical devices and the device itself the student will draw the symbol and a pictorial diagram for each so that each drawing has all of the components labelled in a time period specified by the instructor. 1. Low voltage on-off switch 2. Dual coil (on-off) latching relay 3. Master control station (5 load) 4. Motorized master control station with pilot light - Giving the following electrical outcomes, the student will draw a schematic, wiring diagram, and cable layout (low voltage control) for each so that the circuit works electrically, all connections are correct and minimum amount of material is wasted in a time period specified by the instructor. 1. Lamp controlled from one place 2. 2 lamps in parallel controlled from one place 3. A split convenience outlet controlled from 3 places 4. A lamp controlled from 3 places (continued)	A. Point out and discuss NEC rules on remote control. B. Discuss diagrams and symbols.

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ELECTRICAL

CODE:

MODULE: SIGNAL & REMOTE CONTROL DEVICES

TASK: INSTALL REMOTE CONTROL (cont)

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
with a convenience outlet to remain hot 5. Master control station (5 load) - Given the necessary tools, equipment and a cable layout for each of the following example circuits, the student will install each of the circuits in accordance with N.E.C. and local codes so that there is a minimum amount of wasted material and the completed installation is neat and orderly by: A. Marketing component locations B. Drilling holes for cable runs C. Running and securing cables D. Mounting components E. Making proper connections in a time period specified by the instructor 1. A lamp controlled from one place 2. 2 lamps in parallel controlled from one place 3. A split convenience outlet controlled from 3 places 4. A lamp controlled from 3 places with a convenience outlet to remain hot 5. A 5 load master control station	A. Discuss and show student proper trade method for installing low voltage remote control devices. B. Refer student to text book on remote control systems.

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: ELECTRICAL
MODULE: SIGNAL & REMOTE CONTROL DEVICES

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: Given the necessary tools and equipment, the student will draw a schematic wiring diagram and cable layout and safely install at least 4 example circuits and a 5 load master control station (low voltage control) in accordance with the N.E.C. and local codes in a time period determined by the instructor	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
TASK: Install Remote Control Device						
1. Draw symbol & pictorial diagram for:						
1. L.V. on-off switch						
2. Dual coil (on-off relay)						
3. Master control station						
4. Motorized master control station w/pilot light						
2. Draw a schematic wiring diagram and cable layout for:						
1. Lamp controlled from one place						
2. 2 lamps in parallel controlled from one place						
3. A split convenience outlet controlled from 3 places						
4. A lamp controlled from 3 places with HOT OUTLET						
5. Master Control Station						
3 Install:						
1. A lamp controlled from one place						
2. 2 lamps in parallel controlled from one place						
3. A split convenience outlet controlled from 3 places						
4. A lamp controlled from 3 places with a convenience outlet to remain hot						
5. A 5 load master control station						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: ORIENTATION

UNIT: MASONRY

TASK: LIST SAFETY AND SHOP RULES

CODE:

MAJOR OBJECTIVE

The student will list ten safety and shop behavior rules with 100% accuracy.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify work area and safety hazards - identify personal protective clothing a) uniform b) shoes c) eye protection d) tool usage e) person-to-person behavior	Present safety rules orally or posters in student handbook Material storage Ladder and scaffold Machine Hand Tools

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: MASONRY
MODULE: ORIENTATION

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: The student will list ten safety and shop behavior rules with 100% accuracy.

Conditions: In classroom, without notes in written form

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. List specified number of safety and shop behavior rules						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: ORIENTATION

UNIT: MASONRY

TASK: IDENTIFY BODY MECHANICS FOR LIFTING

CODE:

MAJOR OBJECTIVE

The student will identify correct body mechanics for lifting by answering test questions with 100% accuracy.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify safety hazards, hand tools, work area, material storage, ladders and scaffolds, machine - identify personal protective clothing - demonstrate correct body mechanics for lifting heavy objects - proper personal conduct in the shop	Proper safe handling Hand tools Work area - clean Proper method of stacking material OSHA a) proper clothes b) shoes c) eye protection d) tool usage No horseplay

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: MIXING MORTAR

UNIT: MASONRY

TASK: BLEND MORTAR BY HAND

CODE:

MAJOR OBJECTIVE

The student will select the correct tools and materials and blend a batch of practice mortar to trade acceptable standards of consistency within 20 minutes.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - list the names, uses and care of the tools needed for mixing mortar - identify quality mason sand from three samples of soil within 2 minutes with 100% accuracy - mix a one-bag of sand, lime and water to a trade acceptable standard within 15 minutes, (i.e., heavy whipped cream or butter)	Lessons and Demonstrations 1. Care & use of mixing tools Mortar Mixing Box Mortar Mixing Hoe #2 Square Shovel Pail 2. Show three sand samples Mason sand, plastering sand, concrete sand Demonstrate colormetric and silt test water quality (fit for human consumption) Learning Activity 1. Mixing mortar

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: MASONRY

CODE:

MODULE: MIXING MORTAR

TASK: BLEND MORTAR USING A MACHINE

MAJOR OBJECTIVE

The student will select the correct tools and materials and equipment, and blend a one-bag of mortar to trade acceptable standards of consistency within 10 minutes.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - list the names and uses and care of the tools needed for mixing mortar by machine - list the materials needed to mix M - S - N and practice mortar - mix a one-bag mix of aforementioned mixes to a trade acceptable standard (i.e., heavy whipped cream or butter) within 10 minutes.	Lessons and Demonstrations by instructor's emphasis placed on safety with machine Preventive maintenance cleaning, lubrication, adjustment M-1 - part - 1 Mortar - 6 sand S-½ - part - 1 Mortar - 4½ sand N-O - - 1 Mortar - 3 sand Pract - 1 lime - 3 sand All cubic feet or portional Learning Activity Mixing mortar

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: MASONRY
MODULE: MIXING MORTAR

STUDENT NAME:
DATE:
MODULE COMPLETED: ( )

Conditions I: In classroom area, given necessary samples, without notes

TASKS:		YES	NO
	List name, use and care of required tools (hand) Mortar mixing box, mortar hoe, #2 square shovel pail	( )	( )
	List name, use and care of required tools and equipment (machine) #2 square shovel, pail, mortar mixing machine, mortar box wheelbarrow, hod	( )	( )
	Identify mason sand - plastering, mason and concrete sands	( )	( )

	Portland	Mortar Cement	Sand		
List materials for M Mortar Mix	1	1	6	( )	( )
List materials for S Mortar Mix	½	1	4½	( )	( )
List materials for N Mortar Mix	0	1	3	( )	( )

Conditions II: Live, work setting

TASKS:	Select Tools	Proper Tool Storage	Safety	Meets Trade Standards	Needs Further Instruction
Mix one bag mix (hand)					
Mix one bag mix (machine)					

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BRICK WORK TECHNIQUES

UNIT: MASONRY

TASK: IDENTIFY TOOLS AND MATERIALS

CODE:

MAJOR OBJECTIVE

Given specified basic hand tools and brick samples, the student will identify the name and uses of each with 100% accuracy on a written test within a time specified by the teacher.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will identify: 1) - Brick trowel - Brick hammer - 48" level - 24" level - Brick set - Round and V jointers - Round and V sled runners - Mason line, line blocks, line holders, line pins - Mason rules, spacing and modular - Mash hammer 2) - shapes, types and sizes of brick	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BRICKWORK TECHNIQUES

UNIT: MASONRY

TASK: CONSTRUCT RETURN CORNER

CODE:

MAJOR OBJECTIVE

The student will select proper tools and materials and will construct a four inch return corner using half-bond according to field standards of quality.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - layout corner square a) using framing square method b) using 3-4-5 method - maintain specified gauge - maintain plumb - maintain level - maintain range - rake back	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BRICKWORK TECHNIQUES

UNIT: MASONRY

TASK: LAY BRICK TO A LINE

CODE:

MAJOR OBJECTIVE

The student will lay brick to a line using proper method of handling tools and materials according to standards and time acceptable to instructor

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - spread mortar for full bed - pick up brick in proper manner - identifies faces of different bricks - lay brick without disturbing line - apply proper head joint - perform 5 basic moves in laying brick - set line with trig	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BRICKWORK TECHNIQUES

UNIT: MASONRY

TASK: (JOINTS AND BONDS) & CUTTING

CODE:

MAJOR OBJECTIVE

Given tools and materials, the student will layout and construct a panel of specified size using 3 basic bonds with a specified joint according to trade standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify types of joints, and explain function of each - draw 3 basic bonds and describe purpose of each - identify structural, and ornamental bonds - cut brick to specified size, square and uniform, using brick hammer, and brick set	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: MASONRY

CODE:

MODULE: BASIC BRICKWORK TECHNIQUES

TASK: MOTION STUDY

MAJOR OBJECTIVE

The student will set up a specified work area including foot scaffold, materials scaffold, and tools using acceptable trade practices.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - discuss need for motion study in conserving energy and improving efficiency - draw diagram of work site, showing building, tools, material and equipment - set up work area including scaffolding, tools and material	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BRICKWORK TECHNIQUES

UNIT: MASONRY

TASK: SPREAD MORTAR

CODE:

MAJOR OBJECTIVE

The student will safely and efficiently demonstrate the common methods of spreading mortar to a sufficient thickness to allow a full solid bed joint according to trade acceptable standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - spread mortar to an even thickness, on a 2 x 4 left to right right to left - use pick and dip method left to right right to left - spread mortar for joint thicknesses 3/8 joint 1/2 joint	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BRICKWORK TECHNIQUES

UNIT: MASONRY

TASK: READ MASON'S RULE AND LAYOUT STORY-POLE

CODE:

MAJOR OBJECTIVE

The student will read the coursing scales of each rule (modular and brick spacing) to solve typical trade problems on a test; and the student will lay out a story-pole to 90% accuracy per course.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify the difference between the two rules - solve typical trade problems of a number of courses to a given height, using a brick spacing rule - solve typical trade problems of number of courses to a given height using a modular rule - solve problems of number of courses in a given height using a regular wood folding rule - construct a story-pole - draw an illustration of a "hog in the wall"	Rule identification

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: MASONRY

CODE:

MODULE: BASIC BRICKWORK TECHNIQUES

TASK: IDENTIFY AND REMOVE MORTAR STAIN

MAJOR OBJECTIVE

Given a finished masonry panel, the student will identify the causes of efflorescence and vanadium stains, and remove mortar stain, efflorescence and stains common to new construction, according to acceptable trade standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - dry clean brickwork - wet clean brickwork (acid) - safely handle acid a) determine proportion b) add acid to water c) apply - dress properly for safety - sand blast - identify causes of stains - identify types of stains	1. Causes of stains 2. How to prevent these stains 3. Sometimes efflorescence stains are a desired feature to enhance the beauty of colonial brick

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: MASONRY
MODULE: BASIC BRICKWORK TECHNIQUES

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE:

CONDITIONS: In live, work setting

	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Lay to a line						
2. Set up specified work area						
3. Construct panel using 3 basic bonds						
4. Finish panel using specified joint						
5. Cut brick						
6. Build return corner						
7. Clean brickwork						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BLOCK WORK

UNIT: MASONRY

TASK: IDENTIFY TOOLS AND MATERIAL

CODE:

MAJOR OBJECTIVE

Given specified basic hand tools and block samples, the student will identify name and uses of each with 100% accuracy on a written test within the time specified by the instructor.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will identify: 1) Brick trowel Brick hammer 48" level 24" level Brick set Round and V joiners Round and V sled runners Mason's lines Line holders Line pins Modular mason's ruler Mash hammer 2) identify and classify various block units	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BLOCK WORK

UNIT: MASONRY

TASK: LAY BLOCK TO A LINE

CODE:

MAJOR OBJECTIVE

Given tools and materials, the student will lay block work to a line using proper methods of handling tools and materials according to the standards and time acceptable to the instructor.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - swipe mortar for shell bed - snap & swipe mortar for full bed - identify top and bottom of block - lay block without disturbing line - apply proper head joint - set line	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BLOCK WORK

UNIT: MASONRY

TASK: SPREAD MORTAR

CODE:

MAJOR OBJECTIVE

Given instruction, information and materials, the student will safely and efficiently demonstrate the common method of spreading mortar to a sufficient thickness to allow a full bed joint according to trade acceptable standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - spread mortar to an even thickness on the edge of a 2 x 4 left to right right to left - spread mortar to an even thickness on block, both shell and full bed	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BLOCK WORK

UNIT: MASONRY

TASK: READ MODULAR RULE AND LAYOUT STORY-POLE

CODE:

MAJOR OBJECTIVE

Given instruction and materials, the student will read the coursing scales of a modular rule to solve typical trade problems and lay out a story-pole with 100% accuracy per course.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - solve typical trade problems of number of courses to a given height using modular rule - solve typical trade problems of number of courses to a given height using regular wood, folding rule - construct a story-pole	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BLOCK WORK

UNIT: MASONRY

TASK: MOTION STUDY

CODE:

MAJOR OBJECTIVE

The student will set up a specified work area including foot scaffold, materials scaffold, and tools using acceptable trade practices.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - discuss need for motion study in conserving energy and improving efficiency - draw diagram of work site, showing building, tools, material, and equipment - set up work area including scaffolding, tools, and material	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BLOCK WORK

UNIT: MASONRY

TASK: BONDS, JOINTS AND CUTTING

CODE:

MAJOR OBJECTIVE

Given tools and materials, the student will lay out and construct a panel of specified size using two basic bonds with a specified joint according to trade acceptable standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - identify types of joints and explain the function of each - draw two basic bonds and describe the purpose of each - cut block to specified size square and uniform using brick hammer and brick set	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BLOCK WORK

UNIT: MASONRY

TASK: CONSTRUCT RETURN CORNER

CODE:

MAJOR OBJECTIVE

The student will select the proper tools and materials and will construct an 8" block return corner according to field standards of quality.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - lay out corner square a) using framing square b) using 3-4-5 method - maintain specified gauge plumb level range - describe nominal and actual sizes	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC BLOCK WORK

UNIT: MASONRY

TASK: REMOVE MORTAR STAINS

CODE:

MAJOR OBJECTIVE

Given a finished block panel, the student will remove mortar stains and stains common to new construction to acceptable trade standards

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - dry clean block work a) using abrasive stone b) using broken block piece - repoint any joint imperfections	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: MASONRY
MODULE: BASIC BLOCK WORK

STUDENT NAME:
SCHOOL YEAR:

MET MAJOR OBJECTIVES
DATE COMPLETED

MAJOR OBJECTIVE: CONDITIONS: In live, work setting	Related Information	Material Selection	Tool & Equipment Selection	Tool Usage	Meets Objective Criteria	Needs further Instruction
1. Lay to a line						
2. Let up specified work area						
3. Construct panel using 2 basic bonds						
4. Finish panel using specified joint						
5. Cut block						
6. Build return corner						
7. Clean blockwork						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: PLASTERING

UNIT: MASONRY

TASK: ESTIMATE FOR PARGE & STUCCO

CODE:

MAJOR OBJECTIVE

The student will set up an estimate of materials and labor requirements to do a given parge or two coat stucco job.
Note: Major Objective To Be Rewritten Fall 1977

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - Estimate the square yardage of wall surface to be covered. - Evaluate the difficulty factor of the job. - Estimate the materials needed. - Estimate the man hours (mechanic and helper) to do this job. - Research the cost of materials and labor. - Put together an estimated cost for materials and labor to do a given job.	

COURSE: BUILDINGS INDUSTRIES OCCUPATIONS

MODULE: PLASTERING

UNIT: MASONRY

TASK: SET UP AND PARGE FOUNDATION

CODE:

MAJOR OBJECTIVE

The student will set up and parge a typical foundation wall according to trade standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - Mix parge mortar of proper consistency and material ratio. - Select tools needed and properly care for during and after job performance. - Properly set up work area. - Prepare the job site and lay out his work. - Apply a 1/4" parge coat evenly and properly. - Fine sand finish exposed areas of parge coat - Protect and care for the finished job.	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: TILE SETTING

UNIT: MASONRY

TASK: IDENTIFY TOOLS

CODE:

MAJOR OBJECTIVE

Given a selection of tools used in the tile setters trade, the student will identify all by name within 10 minutes.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will identify: tile cutter tile hammer squeege buttering trowels nole breaker tile nipper carbide tile nipper regular flat trowel tile chissel toothed trowels floor and wall tile saw straight and circular sticks levels 2' and 4'.	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: TILE SETTING

UNIT: MASONRY

TASK: LAYOUT TILE

CODE:

MAJOR OBJECTIVE

The student will layout a specified job with no piece less than 1/2 tile, according to field standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - run the cove base level line at 12 3/4" from the floor at its highest point - set starter stick and plumb line for a proper layout of wall tile to within a plus or minus 1/8"	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: TILE SETTING

UNIT: MASONRY

TASK: INSTALL CERAMIC WALL TILE

CODE:

MAJOR OBJECTIVE

Given a backup sheetrock panel for ceramic tile, the student will install 4 1/4" x 4 1/4" ceramic tile to a plus or minus of 1/16" tolerance in plumb and level

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Given the proper notches trowel, the student will: - spread the mastic in a uniform coat, leaving the ridges of equal height and spacing Given a set of specifications, the student will: - set the tile to field standards of acceptance	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: TILE SETTING

UNIT. MASONRY

TASK: INSTALL FLOOR TILES

CODE:

MAJOR OBJECTIVE

The student will select all material, tools and equipment and install a dry pack mud base ceramic tile floor approximately 5' x 6' within 1/8" tolerance of level within a time specified by the teacher, according to trade standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - select the proper tools - mix and spread the base coat of mortar to a level place within $\pm$ 1/8" tolerance - layout and set the specified tile for the wearing surface - grout and polish the finished floor	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: TILE SETTING

UNIT: MASONRY

TASK: GROUT TILES

CODE:

MAJOR OBJECTIVE

Given a panel of set tile, the student will grout, wash and polish and rejoint the tile to a finish according to trade standards

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - mix the grout to a consistency of trade acceptance - apply the grout to tile panel; let set and point off - wash down and polish the tile panel and mitre all joints to a finished product	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: MASONRY

MODULE: TILE SETTING

STUDENT NAME:

DATE:

MODULE COMPLETED: ☐

Conditions I: Live, work setting

Tasks:	Select Tools	Tool and Equipment Usage	Safety	Standards Met	Needs Further Instruction
Mix mortar					
Prepare base					
Set floor tile					
Spread mastic					
Set wall tile					
Grout and polish					
Layout tile					

Conditions II: In classroom area, without notes, given samples

Task:

The student will identify types and patterns of ceramic tile

yes ☐ no ☐

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: STONE WORK

TASK: CONSTRUCT STRAIGHT STONE VENEER WALL

UNIT: MASONRY

CODE:

MAJOR OBJECTIVE

The student will select one of the three basic stone materials, prepare, safely construct, and clean a straight stone veneer wall 6' long x 4' high within a time limit specified by the teacher according to trade standards.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT

The student will:
- select proper tools
- mix stone mortar to trade standards
- identify three stone classifications
  - igneous
  - metamorphic
  - sedimentary
- construct one of the three basic pattern types
  - ashlar
  - course ashlar
  - rubble
- clean stone work using a detergent cleaner (Sure-clean)	

COURSE: BUILDING INDUSTRIES OCCUPATIONS
UNIT: MASONRY
MODULE: STONE SETTING

STUDENT NAME:
DATE:
MODULE COMPLETED ☐

Conditions I: Live, work setting

Tasks:

	Select Tools	Tool Usage	Safety	Standards Met	Needs Further Instruction	
Mix stone mortar						
Construct one basic stone wall 6' x 4'						
Clean stone						

Conditions II: In classroom area, given samples, without notes

Tasks:

	yes	no
Student identifies three types of stone	☐	☐

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: BASIC PHYSICS OF CLIMATE CONTROL

UNIT: ENVIRONMENTAL CONTROL

TASK: IDENTIFY, CALCULATE AND CONVERT

CODE:

MAJOR OBJECTIVE

Note: Major objective to be developed Fall, 1977

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Student will be able to measure: - heat and temperature Student will be able to calculate and convert: - temperature (F to C) Student will be able to label and identify - types of heat (latent, sensible & specific) - heat transfer (condition, convection, radiation and evaporation) - expansion and contraction Student will be able to convert and calculate British thermal units.	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ENVIRONMENTAL CONTROL

MODULE: BASIC PHYSICS OF CLIMATE CONTROL

STUDENT NAME:

DATE:

MODULE COMPLETED:

Conditions I: In classroom area, given necessary samples, without notes

Tasks:	YES	NO
List name, use & care of required tools	( )	( )
List name, use & care of required equipment	( )	( )
List formulas used to convert temperature (F to C & C to F)	( )	( )
Identify & label three types of heat	( )	( )
Identify & label four types of heat transfer	( )	( )
Identify & calculate B.T.U.	( )	( )

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Conditions II: Live, work setting

Tasks:

	Select Tools	Proper Tool Usage	Select Materials	Safety	Meets Trade Standards	Needs Further Instruction
Given a project, student will measure heat & temperature						
Convert result of project temperature from F to C						
Given a project, student will identify expansion & contraction of liquid						

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ENVIRONMENTAL CONTROL

CODE:

MODULE: DUCT WORK

TASK: LABEL AND IDENTIFY

MAJOR OBJECTIVE

Given identification sheets, the student will label and identify duct work and fittings within instructor's specified time with 90% accuracy.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Student will label and identify: - square tin duct and fittings - round tin tuct and fittings - fiberglass duct and accessories	

COURSE: BUILDING INDUSTRIES OCCUPATIONS STUDENT NAME:

UNIT: ENVIRONMENTAL CONTROL

MODULE: DUCT WORK/LABEL AND IDENTIFY

Conditions I: In classroom area. given necessary samples, without notes

Tasks:	YES	NO
List name, use and care of required tools	( )	( )
List name, use and care of required equipment	( )	( )
Identify and label types of square tin duct and fittings	( )	( )
Identify and label types of round tin duct and fittings	( )	( )
Identify and label types of fiberglass (sheet) duct fittings and accessories	( )	( )
Identify and label types of fiberglass (round) duct fittings and accessories	( )	( )

COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: DUCT WORK

UNIT: ENVIRONMENTAL CONTROL

TASK: CUT AND ASSEMBLE

CODE:

MAJOR OBJECTIVE

Given tools and materials and specifications, the student will cut and assemble square and round tin and fiberglass duct work to trade specified standards for each type with 100% accuracy.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Student will cut and assemble: - square tin duct and fittings to instructors standards - round tin duct and fittings to instructors standards - fiberglass duct and fittings to instructors standards (sheet) - round fiberglass duct and fittings to instructor's standards	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ENVIRONMENTAL CONTROL

MODULE: DUCT WORK/CUT AND ASSEMBLE

CODE:

STUDENT NAME:

DATE:

MAJOR OBJECTIVE COMPLETED ( )

Conditions II: Live, work setting

Tasks:

	Select tools	Tool usage	Select Materials	Safety	Meet trade standards	Need further instruction
Assemble project using square & round tin duct & fittings						
Assemble project using sheet & round fiberglass duct & fittings						

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: PIPE ASSEMBLY

UNIT: ENVIRONMENTAL CONTROL

TASK: IDENTIFY & LABEL

CODE:

MAJOR OBJECTIVE

The student will identify and label all types and kinds of pipes and fittings used in environmental control with 90% accuracy in time alloted by instructor.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
Student will identify and label: - steel pipes & fittings - plastic pipe & fittings - copper tube & fittings	

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ENVIRONMENTAL CONTROL

MODULE: PIPE ASSEMBLY/IDENTIFY AND LABEL

STUDENT NAME:

DATE:

MAJOR OBJECTIVE COMPLETED: ( )

CONDITIONS: In classroom area, given necessary samples, without notes

Tasks:	YES	NO
List name, use and care of required tools	( )	( )
List name, use and care of required equipment	( )	( )
Identify and label types of steel pipes	( )	( )
Identify and label types of steel fittings	( )	( )
Identify and label types of plastic pipes	( )	( )
Identify and label types of plastic fittings	( )	( )
Identify and label types of copper tubing	( )	( )
Identify and label types of copper fittings	( )	( )
Identify and label types of flare fittings	( )	( )
Identify and label types of compression fittings	( )	( )

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COURSE: BUILDING INDUSTRIES OCCUPATIONS

MODULE: PIPE ASSEMBLY

UNIT: ENVIRONMENTAL CONTROL

TASK: CUT, REAM AND ASSEMBLING

CODE:

MAJOR OBJECTIVE

Given materials, the student will cut, ream and assemble water tight project to instructor's standards with 100% accuracy.

ENABLING OBJECTIVES	SUGGESTED INSTRUCTIONAL CONTENT
The student will: - cut, ream and thread steel pipe - assemble a water tight project using steel pipe and fittings - cut, ream and assemble a water tight project using plastic pipe and fittings - cut, ream and prepare copper tubing for soldering - assemble and solder a water tight copper project - cut, ream and assemble a water tight project using flare fittings - cut, ream and assemble a water tight project using compression fittings.	*Note: Project #5 in this module may be used in project #5 in Basic Physics related to principle of climate control.

COURSE: BUILDING INDUSTRIES OCCUPATIONS

UNIT: ENVIRONMENTAL CONTROL

MODULE: PIPE ASSEMBLY/CUT, REAM AND ASSEMBLE

STUDENT NAME:

DATE:

MAJOR OBJECTIVE COMPLETED: ( )

Conditions: Live, work setting

Tasks:

	Select tools	Tool Usage	Select Materials	Safety	Meet Trade Standards	Needs Further Instruction
Cut, ream and thread steel pipe						
Assemble water tight project using steel pipe fittings						
Assemble water tight project using plastic pipe & fittings						
Assemble water tight project using compression fittings						
Cut, ream and prepare copper tubing for copper project						
Assemble and solder a water tight project						

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COMMENTS

The comments below are meant to stimulate discussion among the teachers who will be using these materials during the coming school year. The ideas that are included are meant to be illustrative rather than exhaustive. The comments are presented first in general terms and then in terms of the units and modules following the sequence of the Course Outline. As indicated above in the Introduction, the teachers who will be implementing ISSOE during the 1977-78 school year will decide which changes, if any, and which additions to these materials are necessary. We hope these comments will be helpful to them.

General Comments

1. Criterion Referenced Measures are always needed where missing.

2. Where there are performance tests indicated, it may also be necessary to include a test of knowledge. The knowledge test may be verbally administered or given in a paper/pencil format. Apparently, the teachers attempted to use one format for all assessments even when it did not necessarily match the behaviors specified in the major objectives.

3. The term "paper/pencil" is meant to include all types of objective test items which may be administered through verbalizations, demonstrations, or more formal testing procedures.

4. Criteria are necessary when there is an assessment. Where possible criteria should be explicitly stated rather than the instructor's "time frame and quality standards." If this is not practical, a description of the items that most instructors consider important should be developed.

   Enabling objectives which expand on major objectives should be added, where needed.

5. Suggested instructional content should be added.

6. Perhaps all major objectives related to hand tools could be combined into one module or combined with some of the other content modules.

Specific Comments

UNIT I CARPENTRY

1. MODULE: ORIENTATION TASK: LIST RULES AND PROCEDURES

(a) A better Criterian Referenced Measurement is needed which incorporates major and enabling objectives, for example, a series of test items specifically developed for this major objective.

(b) Is this module important for future employment?

2. MODULE: HAND TOOLS TASK: IDENTIFY & DEMONSTRATE USE OF EACH LAYOUT, MEASURING AND CHECKING DEVICE

(a) Does "identify and demonstrate" in task mean the same as "display" in major objective? The action verbs in task and major objective should match.

(b) Is "tool" and "device" the same? If so, language should be consistent.

(c) If possible, "proper and safe use" should be more specifically defined.

(d) A paper/pencil Criterion Referenced Measurement maybe needed to assess "identify" in addition to the performance Criterion Referenced Measurement.

3. TASK: IDENTIFY, SELECT AND USE PLANING, SMOOTHING AND SHAPING TOOLS

(a) Verbs in task and major objective do not match.

(b) A criterion for "use" is required to complete the major objective.

(c) A paper/pencil Criterion Referenced Measurement is needed in addition to the performance Criterion Referenced Measurement.

A paper/pencil Criterion Referenced Measurement maybe needed to assess "identify" in addition to the performance Criterion Referenced Measurement.

4. TASK: USE HANDSAWS

(a) What is meant by individual task requirements?
(b) A criterion for "use" besides "safely" is necessary. A criterion for "use" is required to complete the major objective.

5. MODULE: HAND TOOLS — TASK: SELECT & USE FASTENING & DISASSEMBLING TOOLS

(a) A criterion for "use" besides "safely" is necessary. A criterion for "use" is required to complete the major objective

(b) A paper/pencil Criterion Referenced Measurement is needed in addition to the performance Criterion Referenced Measurement. A paper/pencil Criterion Referenced Measurement maybe needed to assess "identify" in addition to the performance Criterion Referenced Measurement.

6. TASK: IDENTIFY & SAFELY USE DRILLING AND BORING TOOLS

(a) Verbs in major objective and task do not match. Also, "safely" is used in task but not in major objective. Statement of major objective should be the same on the assessment sheet as on the objective sheet. Simularly for "Task."

(b) A criterion for "use and take care of" is required

7. MODULE: PORTABLE POWER TOOLS — TASK: SAFELY USE PORTABLE ELECTRIC DRILL

(a) The term "safely" is used in task, but not in major objective- perhaps it should be part of major objective and/or enabling objective.

(b) Is it enough that the student use properly or must he/she use throughout the construction of a residential structure. If the latter is true, Criterion Referenced Measurement should be revised.

(c) If possible "proper and safe use" should be more specifically defined. A paper/pencil Criterion Referenced Measurement may be needed to assess "identify" in addition to the performance Criterion Referenced Measurement.

A criterion for "use" is required to complete the major objective.

8. TASK: PERFORM CUTS OF PORTABLE POWER SKILL SAW

(a) Task description on major objective page and assessment page should be the same.

(b) If possible, "proper and safe use" should be more specifically defined. A paper/pencil Criterion Referenced Measurement maybe needed to assess "identify" in addition to the performance Criterion Referenced Measurement. A criterion for "use" is required to complete the major objective.

9. MODULE: PORTABLE POWER TOOLS TASK: SAFELY USE SABRE SAW

(a) Task description on major objective page and assessment page should be the same.

(b) If possible "proper and safe use" should be more specifically defined.

A paper/pencil Criterion Referenced Measurement may be needed to assess "identify" in addition to the performance Criterion Referenced Measurement.

A criterion for "use" is required to complete the major objective

10. TASK: USE ROUTER SAFELY

(a) Verbs in major objective and task do not match.

(b) Task description on major objective page and assessment page should be the same.

A paper/pencil Criterion Referenced Measurement maybe needed to assess "identify" in addition to the performance Criterion Referenced Measurement.

(c) A criterion for the cutting performance is required.

11. TASK: USE RADIAL ARM SAW SAFELY
TASK: USE TABLE SAW SAFELY

(a) Verbs in major objective and task do not match.

(b) The term "safely" is used in task, but not in major objective - perhaps it should be part of major objective and/or enabling objective. A paper/pencil Criterion Referenced Measurement maybe needed to assess "identify" in addition to the performance Criterion Referenced Measurement.

If possible "proper and safe use" should be more specifically defined.

12. MODULE: FOOTING & FOUNDATION FORMS TASK: SITE LAYOUT & ERECTING BATTER BOARDS

(a) Task should be written in action form to match major objective.

13. TASK: ALL

(a) It might be better to have a separate Criterion Referenced Measurement for each task or assessment subsections in which each module's specific performance(s) are listed.

14. MODULE: DECK FRAMING TASK: LAYOUT & INSTALL FLOOR JOIST & BOX HEADER

(a) In major objective, what is the meaning of "select"? Select from what?

(b) Verbs in task and major objective should match.

15. TASK: ALL

(a) It might be better to have a separate Criterion Referenced Measurement for each task or assessment subsections in which each module's specific performance(s) are listed.

16. MODULE: WALL FRAMING TASK: ERECT, PLUMB & BRACE WALL SECTION

(a) Verbs in task and major objective should match.

17. TASK: APPLY SHEATHING

(a) What does "identify" mean in major objective?

18. TASK: ALL

(a) It might be better to have a separate Criterion Referenced Measurement for each task or assessment subsections in which each module's specific performance(s) are listed.

19. MODULE: ROOF FRAMING TASK: IDENTIFY ROOF FRAMING TERMINOLOGY

(a) Why does terminology have to be identified according "to trade standards and teacher's specified time"? It appears that a paper/pencil Criterion Referenced Measurement is needed.

20. MODULE: ROOF FRAMING — TASK: ERECT THE ROOF FRAME

(a) Could "set necessary scaffolding from given information" be included in enabling objectives instead of major objective.

21. TASK: APPLY ROOF SHEATHING

(a) Could "estimate" be included in enabling objectives.

22. TASK: ALL

(a) It might be better to have a separate Criterion Referenced Measurement for each task or assessment subsections in which each module's specific performance(s) are listed.

(b) Why are the criteria stated in the major objectives as "trade standards, building standards, instructor's standards? Is it possible to be more uniform?

23. MODULE: ROOF COVERING — TASK: ALL

(a) Criterion Referenced Measurements are needed.

24. MODULE: EXTERIOR FINISH — TASK: IDENTIFY STYLES OF SIDING & MATERIALS USED FOR EXTERIOR WALL FINISH

(a) Major objective is not clearly stated and could be shortened to read like task with details included in enabling objectives only.

25. TASK: INSTALL WINDOWS & DOORS

(a) Major objective could be shortened to read like task, with some of the details included in enabling objectives only.

26. TASK: INSTALL HORIZONTAL SIDING
TASK: INSTALL VERTICAL SIDING

(a) Verbs in major objective and task do not match.

27. TASK: INSTALL BOX CORNICE

(a) The major objective is faulty gramatically and is difficult to understand.

28. TASK: ALL

(a) It might be better to have a separate Criterion Referenced Measurement for each task or assessment subsections in which each module's specific performance's are listed.

29. MODULE: INTERIOR FINISH TASK: INSTALL DRY WALL

(a) Should the words in parentheses be incorporated into the statement of the major objective?

30. TASK: INSTALL WOOD PANELING

(a) The terms "accuracy" and craftsmanship" should be defined more specifically, if possible. Perhaps this could be done in terms of the behaviors listed on the assessment sheet and/or the enabling objectives.

31. TASK: INTERIOR DOOR & JAMB SET

(a) A criterion is required to complete the major objective. Perhaps this could be done in terms of the behaviors listed on the assessment sheet and/or the enabling objectives.

32. TASK: INSTALL PRE-FAB KITCHEN & BATHROOM CABINETS

(a) The criteria "all" in major objective should be changed to "basic" or to a specific number.

33. TASK: INSTALL WOOD FLOORING

(a) How would "skill and accuracy" be measured?

(b) "Various types" should be changed to "basic types" or a specific number.

(c) A paper/pencil measure is required to assess the first five items listed on the assessment sheet.

34. TASK: INSTALL RESILIENT FLOOR TILE

(a) "Various types" should be changed to "basic types" or a specific number.

35. TASK: INSTALL INTERIOR MOLDINGS AND TRIM

(a) A criterion is required to complete the major objective. Perhaps this could be done in terms of the behaviors listed on the assessment sheet and/or the enabling objectives.

The criteria "all" in major objective should be changed to "basic" or to a specific number.

36. TASK: INSTALL CERAMIC WALL & FLOOR TILE

(a) "Several" should be made more specific.

37. MODULE: INTERIOR FINISH — TASK: LAYOUT & INSTALL SERVICE & MAIN STAIRWAY

(a) Verbs in major objective and task do not match.

(b) A criterion is required to complete the major objective. Perhaps this could be done in terms of the behaviors listed on the assessment sheet and/or the enabling objectives.

UNIT II ELECTRICAL

38. MODULE: ORIENTATION — TASK: DESCRIBE ELECTRICAL INDUSTRY

(a) Is this module necessary for entry-level employment?

(b) Will the student describe orally and/or in written form?

(c) What are the criteria for this major objective?

(d) Is it necessary to include the standard Criterion Referenced Measurement sheet for this major objective?

39. MODULE: CIRCUITRY — TASK: DEFINE AND CONSTRUCT SERIES AND PARALLEL CIRCUIT

(a) A paper/pencil measure is required for items 1, 3, and 4 on the assessment sheet.

(b) "Construct parallel circuit" seems to be missing.

40. TASK: SELECT CONDUCTOR TYPE & SIZE FOR RESIDENCE

(a) Criterion Referenced Measurement and major objective do not match. State or describe might be better than "select."

41. TASK: INSTALL SWITCHES IN A RESIDENCE

(a) A paper/pencil test should be developed for the first 14 items on the assessment sheet.

42. MODULE: MAIN AND SUB-PANEL — TASK: DETERMINE PANEL SIZE AND CIRCUITS

(a) A paper/pencil measure is required for items 1-4, 6 on the assessment sheet.

43. TASK: SELECT AND INSTALL FUSE/ CIRCUIT BREAKER

(a) A paper/pencil measure is required for assessment items 1 - 25.

44. MODULE: SIGNALING & REMOTE CONTROL DEVICES — TASK: INSTALL SIGNAL CIRCUIT

(a) A paper/pencil measure is required for items 1 - 3E on the assessment sheet.

45. — TASK: INSTALL REMOTE CONTROL

(a) A paper/pencil measure is required for items 1. and 2 on the assessment sheet.

UNIT III MASONRY

46. MODULE: ORIENTATION — TASK: LIST SAFETY AND SHOP RULES

(a) A paper/pencil test is needed.

47. — TASK: IDENTIFY BODY MECHANICS FOR LIFTING

(a) Paper/pencil test is needed

(b) The first two performance enabling objectives do not match the major objective

48. MODULE: MIXING MORTAR — TASK: BLEND MORTAR BY HAND
BLEND MORTAR BY USING A MACHINE

(a) Major objective should specify whether the mortar is being mixed by hand or by machine.

49. MODULE: BASIC BRICKWORK TECHNIQUE — TASK: (JOINTS & BONDS)& CUTTING

(a) It is not clear what the task is for the major objective. Should be written in behavioral terms.

50. — TASK: MOTION STUDY

(a) Motion study is not mentioned in major objective. Thus, it is not clear what the task is.

51. — TASK: READ MASON'S RULE & LAY OUT STORY POLE

(a) This major objective might be divided into two different major objectives: one cognitive, one performance.

52. — TASK: ALL

(a) A spearate criterion referenced measure should be developed for each of the major objectives.

53. MODULE: BASIC BLOCK WORK — TASK: 1. READ MODULAR RULE & LAY OUT STORY POLE 2. MOTION STUDY

(a) This major objective might be divided into two different major objectives: one cognitive, one performance.

Motion study is not mentioned in major objective. Thus, it is not clear what the task is.

54. TASK: BONDS JOINTS & CUTTING

(a) It is not clear what the task is from the major objective. It should be written in behavioral terms.

55. TASK: ALL

(a) A separate criterion referenced measure should be developed for each of the major objectives.

56. MODULE: TILE SETTING — TASK: LAYOUT TILE

(a) It is unclear, from major objective, what is being laid out.

57. TASK: INSTALL CERAMIC WALL TILE

(a) How big a section or wall segment is the student to complete ? Is there a time limit?

58. TASK: INSTALL FLOOR TILES

(a) Why is it important to select equipment in this particular module? Similar modules have not included the selection of equipment as part of the major objective.

59. TASK: ALL

(a) A separate criterion referenced measure should be developed for each of the major objectives.

UNIT IV ENVIRONMENTAL CONTROL

60. MODULE: BASIC PHYSICS OF CLIMATE CONTROL — TASK: IDENTIFY, CALCULATE & CONVERT

(a) Two major objectives are needed when there are two types of performances called for, in this case cognitive and physical. Since measures have already been created, major objectives to fit them can easily be written.

SAMPLE PROCESS RATING SCALE

OBJECTIVES: _____ ITEMS TO BE RATED a) MODULE: _____
b)
c)

TASK 1: TASK 2: TASK 3:

INSTRUCTIONS: This scale enables the student to be rated on separate process skills for each task within a module. The skills are rated on a scale from POOR (1) to EXCELLENT (5).

SKILLS	TASK:	1 Poor	2 Inad.	3 Fair	4 Good	5 Excell	TASK:	1 Poor	2 Inad.	3 Fair	4 Good	5 Excell	TASK:	1 Poor	2 Inad.	3 Fair	4 Good	5 Excell

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OBJECTIVES: _____ SAMPLE PROCESS RATING SCALE MODULE: _____

TASK 1: Install dry wall TASK 2: Install wall paneling TASK 3: install molding

INSTRUCTIONS: This scale enables the student to be rated on separate process skills for each task within a module. The skills are rated on a scale from POOR (1) to EXCELLENT (5).

SKILLS	TASK: Install dry wall	Poor 1	Inad. 2	Fair 3	Good 4	Excell 5	TASK: Install wall paneling	Poor 1	Inad. 2	Fair 3	Good 4	Excell 5	TASK: install molding	Poor 1	Inad. 2	Fair 3	Good 4	Excell 5
	select tools materials equipment						select tools materials equipment						select tools equipment materials					
	cut & install sheetrock to wall section						estimate material needs						miter and cope moldings					
	cut sheetrock to allow for ~~electrical outlets~~						cut and install paneling to ~~wall section~~						install baseboard and shoe moldings					
	install corner bead						cut paneling to allow for ~~electrical outlets~~						install chairrail and ceiling molding					
	handle sheet rock properly						install inside and outside ~~corners~~						install door and window trim					
	estimate material needs						handle panels properly											

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RATING OF PRODUCTS

MODULE: _____

INSTRUCTIONS: This scale enables each completed construction to be rated on various product qualities. For each product within a module the qualities can be rated on a scale from POOR (1) to GOOD (3).

PRODUCT QUALITIES	ITEM:			ITEM:			ITEM:		
	POOR 1	FAIR 2	GOOD 3	POOR 1	FAIR 2	GOOD 3	POOR 1	FAIR 2	GOOD 3

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RATING OF PRODUCTS

INSTRUCTIONS: This scale enables each completed construction to be rated on various product qualities. For each product within a module the qualities can be rated on a scale from POOR (1) to GOOD (3).

PRODUCT QUALITIES	ITEM: Dry Wall			ITEM: Paneling			ITEM: Molding		
	POOR 1	FAIR 2	GOOD 3	POOR 1	FAIR 2	GOOD 3	POOR 1	FAIR 2	GOOD 3
cuts sloppy clean									
measurements imprecise precise									
installation/durability shaky strong									
hardware placement inappropriate appropriate									
fit sloppy snug									